April 14, 2000

Andrea M. Labik, Sc. D.
Director
West Virginia Department of Health & Human Resources
Office of Laboratory Services
Environmental Chemistry Laboratory
Charleston, West Virginia

Re: Comments on the March 29, 2000 report entitled "Corrective Action Plan in Response to Laboratory Evaluation Report (SDWA) On-Site Evaluation" (Inorganic Chemistry and Microbiology), November 30-December 1, 1999 and "Corrective Action Plan in Response to SDWA Lab Certification program On-Site Review", December 1-2, 1999.

Dear Dr. Labik:

Thank you for the very positive response detailing correction actions from the on-site SDWA laboratory assessment. Our inspection Team greatly appreciated the professionalism and assistance you and your staff provided during the inspection. We applaud and encourage your plans and efforts to bring your laboratory facilities Internet access. Also, we are hopeful that additional assistance and coordination will be provided by filling the vacant Associate Director position. In terms of the corrective actions planned by the WV, we offer the following comments **(the items which are bolded and in enlarged font require additional consideration):**

Inorganic Chemistry:

General

1. The principle WV state SDWA laboratory must maintain capability and certification for all the contaminants specified in the State Primary Drinking Water Regulations, p. E-1 CLADW, unless the State has been granted wavers for compliance monitoring of these analytes or has contracted with laboratories which are SDWA certified (by EPA or by a state other than WV) for these analytes. A listing of commercial laboratories employed by the State for SDWA compliance monitoring for the analytes not measured at the WV Lab and their current SDWA Certification status (State in which they hold certification, method and analytes) is necessary to complete our records.

WV response: The response from WV did not address this finding. However, this has been discussed with Richard Rogers, EPA Region 3 Water Protection Division, who indicated that this is already part of checked either as part of the Regional review and reviews performed by EPA HQ and is not an issue for the WV's State laboratory. **No additional response is necessary**.

2. Many of the QC acceptance/action limits for inorganic-non-metals where fixed limits. However, these criteria were not included in corresponding Standard Operating Procedures (SOPs), e.g., correlation coefficient limit of 0.995 for NO3. The QC limits must be included in the SOP. In addition, the corrective actions to be taken when limits are exceeded should be added to the SOP. The QA Plan only lists a general approach, the SOP needs to list specifics, e.g., stop analysis, take corrective action to correct problem with new reagents, new calibration standards, new pump tubes, new photo multiplier or colorimeter bulb, etc. Also, the SOP should specify that when QC limits are exceeded that all analysis since the last acceptable QC check are to be repeated.

WV response: Clear and acceptable.

3. Checks of sample preservations, required by CLADW must be recorded, GLP.

WV response: Clear and acceptable.

4. The laboratory has a Sample Rejection Policy. The laboratory must reject samples not preserved as per CLADW, e.g., turbidity, or the data must be flagged indicated that required preservation was not employed and/or required technical holding times were not met.

WV Response: Data flagged to client as "not valid for compliance".

ICP Analyses:

5. All samples prepared for ICP analysis must be digested as according to method, i.e. the addition of 2 mL (1+1) nitric acid and 1 mL of (1+1) hydrochloric acid. This would translate into 700 uL of nitric acid and 350 uL of hydrochloric acid per 35 mL of sample. (EPA94, 200.7, 11.2.3)

WV Response: Acceptable.

EPA Assessor Comment: According to Ted Martin, EPA NERL, the acid concentrations specified in method 200.7 for the ICP standards were dictated by the ICP-MS technique, not for the ICP-AES, since only one sample preparation procedure (200.2) is used for both analtyical techniques. Using the different acid concentration (2%+2%, 2%+1% and even 1% HNO3 only) for the standards for ICP_AES analysis is not considered a problem. There should not be any detectable differences in the data. Therefor if the laboratory would rather keep the acid concentrations consistent with the sample matrix, this is acceptable, as long as, all QC checks are within acceptance limits.

NO2-N & NO3-N:

6. The SOP must be updated to reflect the current EPA methods manual cited by 40 CFR, which is entitled: Determination of Inorganic Substances in Environmental Samples, Aug 1993, EPA/600/R-93/100.

WV response: Clear and acceptable.

7. Stock calibration solutions must be labeled with the date of preparation, analyst and expiration date. Stock solutions should not be retained more then a month (4C) unless verified to be accurate versus a newly prepared QC sample/ampule, GLP. Similarly, calibration standards are to be prepared fresh with each analytical batch of samples or the accuracy of the standards verified accurate versus a newly prepared QC sample /ampule, GLP.

WV response: Clear and acceptable.

8. The samples for nitrite-nitrate must be checked and verified free of chlorine or dechlorinating reagent must be added, EPA 353.2, EPA-600/R-93-100, August 1993.

WV response: 50 ul of 30 g/L of thiosulfate is added to every 50 mL of sample is acceptable.

EPA Assessor comment: The laboratory should check for residual chlorine to verify that the samplers have not rinsed out the preservative.

Ion Chromatography (fluoride, chloride, sulfate):

9. Since the last Proficiency Testing sample for fluoride was "Not Acceptable" it is critically important that the laboratory purchase, analyze and forward PT results to EPA which demonstrate "Acceptable" performance, prior to the analysis of additional compliance samples.

WV response: Clear and acceptable. **Please forward a copy of these results to the inspector to complete the file.**

10. MDLs have not been determined for the Ion Chromatography (IC) analytes. MDLs are required under SDWA regulations CLADW and EPA Method 300.0

WV response: Clear and acceptable. **Please forward a copy of these results to the inspector to complete the file.**

11. An SOP must be prepared for IC analyses, GLP. This can be very brief, with sections referencing EPA Method 300.0 and listing any procedures differing from the referenced method. Where options are listed in the reference method, the SOP must indicate which option/s are actually employed by the laboratory.

WV response: Clear and acceptable. **Please forward a copy of these results to the**

inspector to complete the file.

12. Samples for sulfate are not refrigerated. Compliance samples are to be transported on ice as per CLADW.

WV Response: **Data flagged to client as "not valid for compliance".**

This issue has been discussed with the Region 3 Water Protection Division. This is not considered an acceptable response, i.e., only acceptable if this is a rare occurrence, verus the routine for compliance samples. As a consequence the recommended certification status is "Not Certified" with regard to turbidity, conductance and "Not Acceptable" for the secondary analytes, sulfate and TDS.

13. An initial demonstration of capability is required for each analyte as per Section 7.2.7 CLADW and as detailed in 300.0.

WV response: Clear and acceptable. **Please forward a copy of these results to the inspector to complete the file.**

14. The laboratory has purchased an IC (the first for the lab), but the analyst has not had previous experience with this technology. It is very important that the analyst have formal training available from the instrument manufacturer. It may prove cost effective to host a training course at the WV laboratory (Chimney Drive).

WV response: **Did not address this issue. Please forward response.**

Turbidity:

15. Samples arrive without refrigeration and are held longer then 48 hours. Compliance samples must be maintained at 4C from the time of sampling and analyzed within 48 hour, CLADW.

WV Response: **Data flagged to client as "not valid for compliance"**

This issue has been discussed with the Region 3 Water Protection Division. This is not considered an acceptable response, i.e., only acceptable if this is a rare occurrence, verus the routine for compliance samples. As a consequence the recommended certification status is "Not Certified" with regard to turbidity, conductance and "Not Acceptable" for the secondary analytes, sulfate and TDS.

16. The SOP is dated and does not reference the current required method. The SOP must be

updated to reference EPA-600/R-93-100, August 1993.

WV response: Clear and acceptable. **Please forward a copy of these results to the inspector to complete the file.**

17. A reagent blank is not analyzed. A blank must be analyzed as per CLADW, however, values below the lowest calibration standard are to be reported as per the current practice (< lowest calibration standard).

WV response: Clear and acceptable.

Total Dissolved Solids (TDS):

18. Samples are received without refrigeration. Compliance samples for TDS analyses must be maintained at 4C from the time of sampling, CLADW.

WV Response: **Data flagged to client as "not valid for compliance"**

This issue has been discussed with the Region 3 Water Protection Division. This is not considered an acceptable response, i.e., only acceptable if this is a rare occurrence, verus the routine for compliance samples. As a consequence the recommended certification status is "Not Certified" with regard to turbidity, conductance and "Not Acceptable" for the secondary analytes, sulfate and TDS.

Conductance:

19. Samples for conductance are received without refrigeration. Compliance samples for Conductance must be maintained at 4C from the time of sampling, CLADW.

WV Response: **Data flagged to client as "not valid for compliance"**

This issue has been discussed with the Region 3 Water Protection Division. This is not considered an acceptable response, i.e., only acceptable if this is a rare occurrence, verus the routine for compliance samples. As a consequence the recommended certification status is "Not Certified" with regard to turbidity, conductance and "Not Acceptable" for the secondary analytes, sulfate and TDS.

General Recommendations

WV Response: Clear and acceptable

Certification Status: Based upon the WV responses and discussions with Region 3 Water Protection Division, the recommended certification status is as follows:

Certified:

Arsenic; Antimony; Barium; Beryllium; Cadmium; Chromium; Copper; Lead; Mercury; Selenium; Sodium; Thallium; Nitrite; Nitrate and Fluoride.

Not Certified (concerns with accuracy associate with improper preservation, i.e., not refrigerated): Turbidity, Conductance

Secondary Analytes:

Acceptable: Chloride

Not Acceptable (with major concerns with accuracy associated with improper preservation, i.e., not refrigerated): Sulfate and TDS.

K. Inspectors:

Joseph Slayton 4/14/00
Joseph Slayton Date

Robin Costas 4/14/00
Robin Costas Date

Response to an
SDWA Laboratory Evaluation Report
of the
Office of Laboratory Services
Department of Health and Human Resources
Bureau for Public Health
State of West Virginia
167 - 11th Avenue
South Charleston, WV 25303

On-site Evaluation Performed
on
November 29 - December 1, 1999
by

David E. Russell
Microbiological Evaluator

Office of Analytical Services and Quality Assurance
Environmental Science Center
U.S. Environmental Protection Agency, Region III
Ft. Meade, MD 20755-5350

Response by
Thomas L. Ong, Microbiologist Supervisor
Laboratory Certification Officer
Date of Response: March 28, 2000

Follow-Up Comments by
David E. Russell
Microbiological Evaluator

Date of Comments: April 14, 2000

I. Response to Deviatons

A. As stated in Chapter III (p.III-4), a laboratory analyzing drinking water should prepare a *written* description of its QA/QC activities (a QA plan), the purpose of which is to "ensure that routinely generated analytical data are scientifically valid and defensible, and are of known and acceptable precision and accuracy." QC procedures are to be specified in SOPs *written* for each method used. Furthermore, it is "the responsibility of the QA manager to keep the QA plan up to date". Although SOPs have been drafted for the Colilert and HPC methods, no SOPs exist for the MTF method (used daily to analyze drinking water) or the occasionally used MF and Quanti-Tray techniques. Nor are there written QA/QC procedures for the use and maintenance of laboratory equipment or general laboratory procedures common to all methods. Therefore, although a few of the elements exist in draft form, there is no complete comprehensive QA plan for drinking water microbiology.

WV Response: *The QA Plan/SOP is a number one priority and different parts are currently in the works. For example, the Quanti Tray procedure is now finalized and the MTF method is in the works along with the "QA Forms" section and a General QA Section on Equipment and Reagents. A recent phone conversation with Joe Slayton indicated that only the Drinking Water Certification Program - Microbiology section of the manual made the return voyage back to Ft. Meade. The missing parts will be copied and sent Fed Ex this week and as other parts are completed they will also be forwarded.*

EPA Comment: **The QA Plan/SOP is still needed and when completed needs to be forward to the assessor to complete the record.**

B. Chapter III requires that laboratories, in order to maintain SDWA certification status, analyze PE samples annually. The purpose of this requirement is to confirm that the analytical proficiency of the laboratory is maintained over time despite changes in equipment and personnel that may occur. Although PE samples were successfully analyzed by the Laboratory in 1997 and 1998, none was analyzed in 1999. According to the manual (p. III-7), this omission alone is sufficient basis for downgrading certification status to "provisionally certified".

WV Response: *Since the on-site evaluation, the laboratory was participated in ERA's WS41, on January 10, 2000 for the MTF (100 mL) procedure; WS42, on January 18, 2000 for the Colilert (100 mL) procedure; and WS43 on February 22, 2000 for the Membrane Filter Procedure. In all studies, ERA is to forward a copy of the report to EPA Region III. Currently, the only results that have been received are for WS41 in which all were acceptable. I have compared our results for WS42 to the results listed on*

ERA's internet site - they too appear to be all Accetpable, although we are still awaiting the final report.

If you are not receiving copies of these reports, they may be being sent to Charlie Jones at the Philadelphia office. If you need me to forward these to you, please let me know.

EPA Comment: **The EPA Assessor has contacted the PT provider directly and is awaiting these results. Once "acceptable" PT results have been received the certification status will be upgraded.**

C. Paragraph 1.2(Chapter V) states that "before analyzing compliance samples, the analyst must demonstrate acceptable results for precision, specificity, and satisfactory analysis on unknown samples." Currently the Laboratory has no record of such a demonstration of analytical proficiency for each new analyst, although other records assessing analyst knowledge are being kept. Note that the above mentioned "unknown samples" could be prepared by the supervisor.

WV Response: *At the time of the on-site evaluation, "new analysts" referred to Joe Cochran, Tracy Bossie and Micah Moore. Since then, Micah Moore has left. Joe and Tracy both have successfully examined 10 unknown samples for both the MTF and Colilert procedures. This practice is now in place for all new analysts that are hired.*

EPA Comment: Acceptable

D. The Laboratory should be highly commended for it's practice of rejecting (without analysis) all *drinking water* samples that exceed the 30 hour holding time. *Source water*, however, has a sample holding time of 8 hours (paragraph 6.4 and Surface Water Treatment Rule, 40 CFR 141.74(a)), the purpose of which is to minimize changes in the sample's bacterial assemblage during the period between collection and analysis. Currently this holding time is regularly exceeded because *source water* samples are routinely analyzed the morning after the day they are collected. In addition negative results for the samples that have exceeded the holding time are not flagged as required by paragraph 8.3.5 (as modified in "Errata").

WV Response: *The majority of source water samples are received in the mail so the 8 hours holding time is exceeded. Source waters that are received the day they are collected are analyzed the same day (within 8 hours).*

All samples that are received exceeding 8 hours are still analyzed; however, the report forms are now mark as "EXCEEDED 8 HOURS - INVALID" in the

"Laboratry Remarks" section.

EPA Comment: Acceptable

II. Response to Recommendations

A. According to paragraph 3.1.5, all pH buffers used "should be dated upon receipt and when opened." Of the three buffer solutions (4.0, 7.0, 10.0) currently in use, two had only the date received marked on them and the third no dates at all. It is recommended as a matter of good laboratory practice that dates received and opened, and the initials of the analyst recording those dates, be marked on all pH buffers in use.

WV Response: *It is laboratory procedure to indicate the date received/opened on the buffers. The laboratory uses about a bottle every two weeks. The unmarked bottle during the on-site was a rare oversight of the analyst. We are going to start the practice of recording the analysts initials along with the dates.*

EPA Comment: Acceptable

B. According to paragraphs 3.3.2, calibrations of glass and electronic thermometers should be checked annually against an NIST reference thermometer and the results recorded in a log book. Although considerable records of thermometer calibrations were available, they were not organized in such a way as to easily determine the history of calibration of individual thermometers. This problem had been already identified by the Laboratory and a new form or log sheet had been create, but was not yet in use at the time of the on-site visit. One of the new forms will be used for each thermometer; therefore, the record of calibrations for any one thermometer will be readily available. The Laboratory should be commended for this improvement in record keeping.

WV Response: *New forms are now in use.*

EPA Comment: Acceptable

C. A further improvement in temperature record keeping would be to re-design the temperature recording tables to include the thermometer reading and the corrected temperature for each time the thermometer is read. When only the corrected temperature is recorded, there is no documentation that the analyst actually corrected the thermometer reading with the appropriate correction factor.

WV Response: *Currently, there is not enough room on the form to record the math as the main incubator contains 5 thermometers. All analysts are trained to record the corrected temperature.*

EPA Comment: Acceptable

D. Regarding records kept for each autoclave, it is recommended that the autoclave for which the records are being kept be clearly indicated on the record form. Although the clip board with the autoclave records hangs next to the relevant autoclave, there is no association recorded on paper between the records and the autoclave.

WV Response: *Forms now indicate to which autoclave they belong.*

EPA Comment: Acceptable

E. According to paragraph 3.11.5, the "lot number for membrane filters and date received should be recorded." The Laboratory has records of this QC practice up to 1997, but not beyond. The practice should be re-established.

WV Response: *We have not begun using membrane filter procedure for any samples. However, since we do certify other laboratories for the procedure we are going to maintain certification for it by annually analyzing PE samples and quarterly running a few samples and performing duplicate counts so that everyone can keep in practice with it. All appropriate QC forms that accompany the MF procedure will be in order. For the filters, the lot number, date received and date put into service will be recorded on a QC form.*

EPA Comment: Acceptable

F. Although the Laboratory, pursuant to paragraph 3.14.2, is checking the calibration of each new lot of pre-calibrated test vessels (for Colilert test) and has produced a commendable record documenting this QC practice, it is recommended that the actual volume obtained be recorded instead of only a check mark. A record of actual volumes would provide raw data that could be assessed independently by other analysts, the microbiology supervisor, or the Laboratory QA officer, and therefore would represent better documentation. Long term trends in test vessel calibration could also be identified.

Response: *Actual volumes are now being recorded.*

EPA Comment: Acceptable

G. According to paragraph 4.4.3, "each batch of dilution/rinse water should be checked for sterility by adding 50 mL of water to 50 mL of a double strength non-selective broth (e.g., tryptic soy, trypticase soy, or tryptose broth)" and incubated at 35±0.5 °C for 24 hours. If growth occurs entire batch of dilution water should be discarded. At the time of the on-site visit, the Laboratory was not performing this QC sterility check. It is

strongly recommended that this QC procedure be performed on all batches of dilution or rinse water, and the results recorded with the other media and dilution water preparation records. Note that if the 50 mL of non-selective broth is sterilized in a typical dilution bottle, the sterility check of the dilution or rinse water can be performed by pouring (with sterile technique) 50 mL of the water into the bottle containing the broth and incubating.

WV Response: *This procedure use to be in place but for some reason, possibly the turn-over in personnel, was forgotten. This procedure is now being put back into place.*

EPA Comment: Acceptable

H. It is further recommended that, as matter of good laboratory practice, whenever the pH of a batch of media falls outside the acceptable range, the action taken (e.g., "batch discarded") and analyst's initials be recorded in the media prep log book.

WV Response: *The laboratory has in the past used "REJECTED" stickers when this happens. However, an example of this could not be found during the on-site, nor could the "REJECTED" stickers be found. I will be making new rejected stickers for this purpose and have the analysts initial and record the action taken.*

EPA Comment: Acceptable

I. Currently when performing the Colilert analysis, the 100 mL±2.5 mL sample test volume is obtained by carefully decanting 100 mL of the sample directly into the sterile IDEXX test vessel and subsequently comparing the volume in the test vessel against a second vessel clearly marked with the acceptable volume range (97.5-102.5 mL). It is recommended that this procedure be improved by doing the comparison at eye-level to make the best evaluation possible. Both bottles should be placed side by side on a platform fixed at eye-level. This recommendation follows what is generally accepted as good laboratory practice when reading any graduated measuring device, such as graduated cylinders or pipettes, i.e., they should always be read at eye-level.

WV Response: *We are going to contact the maintenance department and see if a shelf can be built over the middle of the table.*

EPA Comment: Acceptable

J. Although the laboratory keeps detailed records of all analytical work, including the time an analysis begins, the time any subsequent analyses begins is not recorded. Paragraph 8.4.2 is understood to apply to any subsequent or additional analysis begun after the initial analysis. For example, if a positive MTF test is transferred to BGBB for confirmation, the time of the transfer should be recorded because the BGBB

confirmatory test is a new analysis. Likewise if a positive MTF test is also transferred to EC medium for fecal coliforms, the time of transfer should be recorded because it marks the beginning of a new analysis. In other words, it is recommended that for the purpose of quality control, there should be documen-tation that all tests--presumptive, confirmatory, initial, subsequent, or otherwise--were incubated for the appropriate periods. Documentation on a batch by batch basis would be sufficient.

WV Response: *We are now making notes on the bench sheets with the start times of all analysis and when samples are read out.*

EPA Comment: Acceptable

K. Similarly, it is recommended that for the Colilert analysis the time when the Colilert tests are read be recorded. This practice would be most important in those cases where a test, following the normal 24 hour incubation, is incubated for an additional 4 hours. The manufacturer cautions that a positive result (yellow color) after incubation for more than 28 hours is not a valid positive. Care should be taken not to incubate samples in excess of 28 hours. (See paragraph 5.6.5.)

WV Response: *See response to Item "J".*

EPA Comment: Acceptable

L. At the present time, in order to neutralize residual chlorine in a sample, sample bottles are loaded with the appropriate amount of sodium thiosulfate prior to sterilization of the bottle. In addition, when performing the Colilert test, sample is poured into a sterile test vessel that also contains sodium thiosulfate in powdered form. Consequently, residual chlorine is probably being effectively neutralized in all samples analyzed with Colilert. However, with regard to the MTF method, it is possible that in some cases, excessive chlorination is not completely neutralized by the sodium thiosulfate in the sample bottle. It is recommended that a portion of these samples each month (e.g., 10%) be tested with a drop of iodine solution for excess sodium thiosulfate which will be present if all residual chlorine was neutralized. The iodine drop test could be easily performed (by a second analyst) on the sample water remaining in the collection bottle once the 100 mL test volume was removed. The sodium thiosulfate reacts with the iodine to produce sodium tetrathionate and sodium iodide both of which are colorless; consequently the amber color produce by the drop of iodine quickly disappears. If sodium thiosulfate is not present the amber color remains. A similar recommendation was made in 1996.

WV Response: *We have not yet started this procedure. Is there a written procedure that could be forwarded? And could you provide information as to were to obtain the "Iodine Solution"?*

EPA Comment: Acceptable

M. Currently water samples are collected in unmarked bottles and sent to the laboratory with the collection form wrapped around the bottle. Once the unmarked bottle containing the sample arrives in the laboratory, the identity of the bottle and sample depends entirely on the collection form staying with the sample. Because there is no unique identifier (such as a number) on the bottle, there is always the risk of losing the identity of the sample should the collection form and sample become separated. It is recommended that each sample bottle be marked (using an indelible ink marker) with a unique number that is recorded on the sample collection form by the collector. This procedure would insure that all collection information is clearly associated with a sample whether the collection form is kept with the sample or not.

WV Response: *We are in the process of ordering new Water Bacteriological Report Forms. The new forms will have a place to record the sample container number. We will be beginning the process of numbering all of our sample containers.*

EPA Comment: Acceptable

V. Conclusions

A QAP/SOP and successful analysis of PE samples annually are essential requirements for maintaining full SDWA certification. **If EPA receives confirmation that PE samples have been successfully analyzed for total coliform and fecal coliform (or E. coli) bacteria, and a QAP/SOP is completed, the Laboratory will be recommended for full certification under the Safe Drinking Water Act.**

David E. Russell — 4/14/00
David E. Russell — Date
Microbiological Evaluator

WV Responses to EPA's April Updates 3/00 (Micro) 5/00 (Chem)

3/29/00

Response to an
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On-site Evaluation Performed

on

November 29 - December 1, 1999

by

David E. Russell
Microbiological Evaluator

Office of Analytical Services and Quality Assurance
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U.S. Environmental Protection Agency, Region III
Ft. Meade, MD 20755-5350

Response by

Thomas L. Ong, Microbiologist Supervisor
Laboratory Certification Officer

Date of Response: March 28, 2000

I. Response to Deviatons

Ex. 5 - Deliberative

As stated in Chapter III (p.III-4), a laboratory analyzing drinking water should prepare a *written* description of its QA/QC activities (a QA plan), the purpose of which is to "ensure that routinely generated analytical data are scientifically valid and defensible, and are of known and acceptable precision and accuracy." QC procedures are to be specified in SOPs *written* for each method used. Furthermore, it is "the responsibility of the QA manager to keep the QA plan up to date". Although SOPs have been drafted for the Colilert and HPC methods, no SOPs exist for the MTF method (used daily to analyze drinking water) or the occasionally used MF and Quanti-Tray techniques. Nor are there written QA/QC procedures for the use and maintenance of laboratory equipment or general laboratory procedures common to all methods. Therefore, although a few of the elements exist in draft form, there is no complete comprehensive QA plan for drinking water microbiology.

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D. Regarding records kept for each autoclave, it is recommended that the autoclave for which the records are being kept be clearly indicated on the record form. Although the clip board with the autoclave records hangs next to the relevant autoclave, there is no association recorded on paper between the records and the autoclave.

Response: *Forms now indicate to which autoclave they belong.*

E. According to paragraph 3.11.5, the "lot number for membrane filters and date received should be recorded." The Laboratory has records of this QC practice up to 1997, but not beyond. The practice should be re-established.

Response: *We have not begun using membrane filter procedure for any samples. However, since we do certify other laboratories for the procedure we are going to maintain certification for it by annually analyzing PE samples and quarterly running a few samples and performing duplicate counts so that everyone can keep in practice with*

it. All appropriate QC forms that accompany the MF procedure will be in order. For the filters, the lot number, date received and date put into service will be recorded on a QC form.

F. Although the Laboratory, pursuant to paragraph 3.14.2, is checking the calibration of each new lot of pre-calibrated test vessels (for Colilert test) and has produced a commendable record documenting this QC practice, it is recommended that the actual volume obtained be recorded instead of only a check mark. A record of actual volumes would provide raw data that could be assessed independently by other analysts, the microbiology supervisor, or the Laboratory QA officer, and therefore would represent better documentation. Long term trends in test vessel calibration could also be identified.

Response: *Actual volumes are now being recorded.*

G. According to paragraph 4.4.3, "each batch of dilution/rinse water should be checked for sterility by adding 50 mL of water to 50 mL of a double strength non-selective broth (e.g., tryptic soy, trypticase soy, or tryptose broth)" and incubated at 35±0.5 °C for 24 hours. If growth occurs entire batch of dilution water should be discarded. At the time of the on-site visit, the Laboratory was not performing this QC sterility check. It is strongly recommended that this QC procedure be performed on all batches of dilution or rinse water, and the results recorded with the other media and dilution water preparation records. Note that if the 50 mL of non-selective broth is sterilized in a typical dilution bottle, the sterility check of the dilution or rinse water can be performed by pouring (with sterile technique) 50 mL of the water into the bottle containing the broth and incubating.

Response: *This procedure use to be in place but for some reason, possibly the turn-over in personnel, was forgotten. This procedure is now being put back into place.*

H. It is further recommended that, as matter of good laboratory practice, whenever the pH of a batch of media falls outside the acceptable range, the action taken (e.g., "batch discarded") and analyst's initials be recorded in the media prep log book.

Response: *The laboratory has in the past used "REJECTED" stickers when this happens. However, an example of this could not be found during the on-site, nor could the "REJECTED" stickers be found. I will be making new rejected stickers for this purpose and have the analysts initial and record the action taken.*

I. Currently when performing the Colilert analysis, the 100 mL±2.5 mL sample test volume is obtained by carefully decanting 100 mL of the sample directly into the sterile IDEXX test vessel and subsequently comparing the volume in the test vessel against a second vessel clearly marked with the acceptable volume range (97.5-102.5 mL). It is recommended that this procedure be improved by doing the comparison at eye-level to

make the best evaluation possible. Both bottles should be placed side by side on a platform fixed at eye-level. This recommendation follows what is generally accepted as good laboratory practice when reading any graduated measuring device, such as graduated cylinders or pipettes, i.e., they should always be read at eye-level.

Response: *We are going to contact the maintenance department and see if a shelf can be built over the middle of the table.*

J. Although the laboratory keeps detailed records of all analytical work, including the time an analysis begins, the time any subsequent analyses begins is not recorded. Paragraph 8.4.2 is understood to apply to any subsequent or additional analysis begun after the initial analysis. For example, if a positive MTF test is transferred to BGBB for confirmation, the time of the transfer should be recorded because the BGBB confirmatory test is a new analysis. Likewise if a positive MTF test is also transferred to EC medium for fecal coliforms, the time of transfer should be recorded because it marks the beginning of a new analysis. In other words, it is recommended that for the purpose of quality control, there should be documen-tation that all tests--presumptive, confirmatory, initial, subsequent, or otherwise--were incubated for the appropriate periods. Documentation on a batch by batch basis would be sufficient.

Response: *We are now making notes on the bench sheets with the start times of all analysis and when samples are read out.*

K. Similarly, it is recommended that for the Colilert analysis the time when the Colilert tests are read be recorded. This practice would be most important in those cases where a test, following the normal 24 hour incubation, is incubated for an additional 4 hours. The manufacturer cautions that a positive result (yellow color) after incubation for more than 28 hours is not a valid positive. Care should be taken not to incubate samples in excess of 28 hours. (See paragraph 5.6.5.)

Response: *See response to Item "J".*

L. At the present time, in order to neutralize residual chlorine in a sample, sample bottles are loaded with the appropriate amount of sodium thiosulfate prior to sterilization of the bottle. In addition, when performing the Colilert test, sample is poured into a sterile test vessel that also contains sodium thiosulfate in powdered form. Consequently, residual chlorine is probably being effectively neutralized in all samples analyzed with Colilert. However, with regard to the MTF method, it is possible that in some cases, excessive chlorination is not completely neutralized by the sodium thiosulfate in the sample bottle. It is recommended that a portion of these samples each month (e.g., 10%) be tested with a drop of iodine solution for excess sodium thiosulfate which will be present if all residual chlorine was neutralized. The iodine drop test could be easily performed (by a second analyst) on the sample water

remaining in the collection bottle once the 100 mL test volume was removed. The sodium thiosulfate reacts with the iodine to produce sodium tetrathionate and sodium iodide both of which are colorless; consequently the amber color produce by the drop of iodine quickly disappears. If sodium thiosulfate is not present the amber color remains. A similar recommendation was made in 1996.

Response: *We have not yet started this procedure. Is there a written procedure that could be forwarded? And could you provide information as to were to obtain the "Iodine Solution"?*

M. Currently water samples are collected in unmarked bottles and sent to the laboratory with the collection form wrapped around the bottle. Once the unmarked bottle containing the sample arrives in the laboratory, the identity of the bottle and sample depends entirely on the collection form staying with the sample. Because there is no unique identifier (such as a number) on the bottle, there is always the risk of losing the identity of the sample should the collection form and sample become separated. It is recommended that each sample bottle be marked (using an indelible ink marker) with a unique number that is recorded on the sample collection form by the collector. This procedure would insure that all collection information is clearly associated with a sample whether the collection form is kept with the sample or not.

Response: *We are in the process of ordering new Water Bacteriological Report Forms. The new forms will have a place to record the sample container number. We will be beginning the process of numbering all of our sample containers.*

Conclusion

The laboratory would like to thank Dr. Russel and the EPA team for all of the information obtained during the on-site. Since this document is being sent electronically, I was unable to include any attachments (completed QC Records). If the QC records are needed as verification to the above responses, please let me know and I will forward them by FedEx.

5/14/00 SLS

RESPONSE TO EPA'S COMMENTS

ON

WEST VIRGINIA'S CORRECTIVE ACTION PLAN

RELATIVE TO

THE LABORATORY EVALUATION REPORT (SDWA)

RESULTING FROM THE

ON-SITE EVALUATION BY EPA REGION III EVALUATORS

November 30 – December 1, 1999

FROM

WEST VIRGINIA DEPARTMENT OF HEALTH & HUMAN RESOURCES

OFFICE OF LABORATORY SERVICES

ENVIRONMENTAL CHEMISTRY LABORATORY

CHARLESTON, WEST VIRGINIA

REQUIRED ADDITIONAL COMMENTS TO ITEMS BOLDED IN ENLARGED FONT

Inorganic Chemistry

Ion Chromatography (fluoride, chloride, sulfate):

9. Since the last Proficiency Testing sample for fluoride was "Not Acceptable" it is critically important that the laboratory purchase, analyze and forward PT results to EPA which demonstrate "Acceptable" performance, prior to the analysis of additional compliance samples.

A WS-Type proficiency sample for fluoride and manganese (since this was also "missed" on our last WS sample) will be ordered during the week of May 15, 2000 – results from this proficiency sample will be forwarded to Region III as soon as they are received.

Ex. 5 - Deliberative

10. MDLs have not been determined for the Ion Chromatography (IC) analytes. MDLs are required under SDWA regulations CLADW and EPA Method 300.0. **Please forward a copy of these results to the inspector to complete the file.**

Ex. 5 - Deliberative

The required MDLs have since been determined. Due to the required bulk of paper that will need to be forwarded to the EPA inspector the MDL study and other documents are being forwarded by separate mail .

11. An SOP must be prepared for IC analyses, GLP. **Please forward a copy of these results to the inspector to complete the file.**

Requisite SOP(s) have been written, and is/are being forwarded by separate mail.

13. An initial demonstration of capability is required for each analyte as per Section 7.2.7 CLADW and as detailed in 300.0. **Please forward a copy of these results to The inspector to complete the file.**

The initial demonstration of capabilities have been completed and are being Forwarded by separate mail.

14. The laboratory has purchased an IC, but the analyst has not had previous experience with this technology. It is very important that the analyst have formal training available from the instrument manufacturer. It may prove cost effective to host a training course at the WV laboratory (Chimney Drive). **Did not address this issue. Please forward response.**

Severe budgetary restraints preclude sending the chemist (Greg Young) off-site for further training. Greg has been getting considerable help from Dionex technical personnel and has demonstrated improvement in fluoride analyses, the principal area in which he formerly had difficulties – all QC data look very good – I feel (comment from lab supervisor) that his proficiency in analyzing fluoride, chloride and sulfate are now quite acceptable. However, if it is at all possible, I would be much in favor of hosting a training course at our laboratory as a means of further honing his skills in IC analysis.

Ex. 5 - Deliberative

Ex. 5 - Deliberative

16. The SOP is dated and does not reference the current required method. The SOP must be updated to reference EPA-600/R-93-100, August 1993. *It is assumed that the method referred to is that for the analysis for* ***Combined Nitrate/Nitrite.*** **Please forward a copy of these results to the inspector to complete the file.**

A copy of the required SOP is being forwarded by separate mail.

Answers to EPA inspector comments numbers 12, 15, 18 and 19 will be made together since all comments refer to "compliance" samples. For clarity each comment will be listed with the common statement that followed each numbered comment.

Ex. 5 - Deliberative

12. Samples for sulfate are not refrigerated. ***Compliance*** (my italics) samples are to be transported on ice as per CLADW.

15. Samples (for turbidity) arrive without refrigeration and are held longer then 48 hours ***Compliance*** samples must be maintained at 4C from the time of sampling and analyzed within 48 hours, CLADW.

18. Samples (for TDS) are received without refrigeration. ***Compliance*** samples for TDS analyses must be maintained at 4C from the time of sampling, CLADW.

19. Samples for conductance are received without refrigeration. Compliance samples fo Conductance must be maintained at 4C from the time of sampling, CLADW.

COMMON STATEMENT: This issue has been discussed with the Region 3 Water Protection Division. This is not considered an acceptable response, i.e., only acceptable if this is a rare occurrence, versus the routine for compliance samples. As a consequence the recommended certification status is "Not Certified" with regard to turbidity, conductance and "Not Acceptable" for the secondary analytes, sulfate and TDS.

Although it seemed otherwise to the EPA inspector our laboratory performs compliance analyses only for nitrate, nitrite, combined nitrate/nitrite, lead and copper and a few samples that are submitted for metals analyses by water systems. During 1999 we had a number of samples submitted that were marked on the sample I. D. card as being "Regulatory Compliance" samples. These samples were

submitted by Clement Sees (the only District Engineer who routinely sends our laboratory "sanitary survey" samples for analysis). Mr. Sees has explained to me that during 1999 he was required to perform sanitary surveys of non-community water systems. These apparently are not required annually. The sample I. D. card that we have been using does not contain a selection for "Sanitary Survey" (see copy of this I. D. card, enclosed) for the "Reason for Collection". I am enclosing a letter from Mr. Sees which explains that since the selection "Annual Plant Review" did not explain the sample purpose he chose "Regulatory Compliance". Previously, when submitting samples for Community Water Systems he has routinely chosen "Annual Plant Review" as being the appropriate selection. He has recently begun checking the "Other" box and fills in the blank with "Sanitary Survey". We have now (following a recent telephone call to Mr. Sees as a means of clarifying the actual status of these samples) revised our sample I. D. card to replace "Annual Plant Review" with "Sanitary Survey/Plant Review". He feels that this will clarify, and simplify, the correct identification of samples submitted for "Sanitary Survey" purposes. A number of the new sample I. D. cards have been made and sent to Mr. Sees for his use. A copy of the new I. D. card has also been included for your examination. When sending in sanitary survey samples he almost universally (among other analytes) requests analyses for chloride, fluoride, sulfate, alkalilnity and TDS. Of the remaining samples we receive for these analyses (usually performed for private citizens) none are for compliance purposes. On rather rare occasions Mr. Sees will include requests for analyses for turbidity ~~and/or~~ conductivity for his sanitary surveys. Once again, the few remaining requests we receive for these ~~two parameters are not for~~ compliance purposes. In the future we will exercise greater care in determining if samples are for compliance purposes. If they are determined to be of this category we will ensure that they are appropriately shipped to our laboratory and analyzed within the EPA designated holding times.

OK

OLD SAMPLE IDENTIFICATION CARD

Name of Water System or Owner's Name_____

_____

Address_____

_____Zip Code_____

[ ] Public System PWS ID#_____ [ ] Private Source

Source: [ ] Well, [ ] Spring, [ ] River/ Creek, [ ] Impoundment, [ ] Cistern, [ ] Purchased

Water Type: [ ] Raw, [ ] Treated, [ ] Lab Pure, [ ] Other_____

Point of Collection_____

Name of Collector_____

Title: [ ]District Engineer, [ ]Sanitarian, [ ]Operator, [ ]Owner

County_____

Date & Time of Collection_____

Reason for Collection: [ ]Regulatory Compliance, [ ]Annual Plant Review, [ ] Complaint, [ ] Other_____

NEW SAMPLE IDENTIFICATION CARD

Name of Water System or Owner's Name_____

_____

Address_____

_____Zip Code_____

[ ] Public System PWS ID#_____ [ ] Private Source

Source: [ ] Well, [ ] Spring, [ ] River/ Creek, [ ] Impoundment, [ ] Cistern, [ ] Purchased

Water Type: [ ] Raw, [ ] Treated, [ ] Lab Pure, [ ] Other_____

Point of Collection_____

Name of Collector_____

Title: [ ]District Engineer, [ ]Sanitarian, [ ]Operator, [ ]Owner

County_____

Date & Time of Collection_____

Reason for Collection: [ ] Regulatory Compliance, [ ] Sanitary Survey/Plant Check, [ ] Complaint, [ ] Other_____

STATE OF WEST VIRGINIA
DEPARTMENT OF HEALTH AND HUMAN RESOURCES

Cecil H. Underwood
Governor

Joan E. Ohl
Secretary

May 1, 2000

Mr. Wayne Morganroth
West Virginia Department of Health and Human Resources
Environmental Chemistry Laboratory
4710 Chimney Drive, Suite G
Charleston, WV 25302

Dear Mr. Morganroth,

This letter is in response to our telephone conversation on May 1, 2000. I now know that I had mistakenly marked the sample tags Regulatory Compliance for Annual Plant Review for testing for sanitary surveys. The reason being is that sanitary surveys are not performed annually. Your suggestion of revising the sample tags to include sanitary surveys will eliminate this potential for mismarking the tags.

I apologize for any problems my mistake may have caused you.

Sincerely,

Clement F. Sees Jr.

Clement F. Sees, Jr., P.E.
District Engineer

BUREAU FOR PUBLIC HEALTH
Office of Environmental Health Services
WHEELING DISTRICT OFFICE
Methodist Building, Suite 117
Wheeling, West Virginia 26003
Telephone (304) 238-1145 FAX (304) 238-1002

Fax Transmittal Memo 7672

To Joseph Slayton, Associate Director of Science		From Wayne Morganroth	
Company EPA Region III, OASQA		Company WV DHHR, Bur. Pub. Health, Env. Chem. Lab	
Location Ft. Meade, Md.		Location Charleston, WV	Dept. Charge
Fax # 1-410-305-3095	Telephone #	Fax # 1-304-558-4143	Telephone #
Comments Respone to 4-14-00 EPA Comments		Original Disposition: ☐ Destroy ☐ Return ☐ Call for pickup	

No. of Pages: 9 | Today's Date: 5-14-00 | Time:

Ex. 5 - Deliberative

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MD 20755-5350

June 8, 2000

Andrea M. Labik, Sc. D.
Director
West Virginia Department of Health & Human Resources
Office of Laboratory Services
Environmental Chemistry Laboratory
Charleston, West Virginia

Re: Follow-up to the May 14, 2000 report entitled "Response to EPA's Comments on West Virginia's Corrective Action Plan Relative to the Laboratory Evaluation Report (SDWA) Resulting from the On-Site Evaluation By EPA Region III Evaluators" (Inorganic Chemistry) and Follow-up to the May 14, 2000 report entitled , "Response to EPA's Comments on West Virginia's Corrective Action Plan, Relative to the SDWA Lab Certification Program Resulting from the On-Site Evaluation by EPA Region III Evaluators".

Dear Dr. Labik:

Thank you for the follow-up response to items not fully addressed by the correction actions planned relative to the on-site SDWA assessment. We hope that you will continue to pursue your plans and efforts to bring your laboratory facilities Internet access. The continued lack of E-Mail at "Big Chimney" continues to slow communications concerning inorganic chemical analyses and SDWA certification program (chemistry).

Dr. David Russell is working with Tom Ong to close out the remaining microbiology issues and will be providing a close out letter in the near future.

We understand that Charlotte Billingsley is back working part time. Great News! Please convey are well wishes.

Inorganic Chemistry:

All of the inspection findings have been addressed and the assessors agree with the corrective actions. However, relative to the purchase of PT samples for fluoride and other anions (planned for May 15th) , the assessors request that you provide a projected date when the PT study results would be forwarded to EPA.

With regard to the issue of drinking water samples which are not properly preserved or which exceed the required holding time, further discussions with our Region 3, Water Protection Division Program Office (Office of Municipal Assistance) has provided the following resolution of this issue: The laboratory is to flag (label) the analytical results for drinking water samples which are not properly preserved or do not meet the technical holding times with "Not Valid for SDWA Compliance Reporting". Based upon this approach, we recommend that the certification status for Turbidity and Conductance be upgraded to "Fully Certified" and that sulfate and TDS be upgraded to fully "acceptable" (secondary analytes).

Certification Status: The assessors recommend the following SDWA certification status based upon the November 30, 1999 on-site laboratory inspection and the resulting corrective actions:

Certified:

Arsenic; Antimony; Barium; Beryllium; Cadmium; Chromium; Copper; Lead; Mercury; Selenium; Sodium; Thallium; Nitrite; Nitrate, Fluoride, Turbidity, Conductance.

Secondary Analytes:

Acceptable: Chloride, Sulfate and TDS.

SDWA Laboratory Certification Program: All of the suggestions to improve the program resulting from the December 1, 1999 review have been implemented. Please thank your Certification Officers for their efforts.

Inspectors:

6/8/00 6/8/00
Joseph Slayton Date

6/8/00 6.8.00
Robin Costas Date

Sincerely,

Joseph Slayton
Associated Director of Science

cc: Charles Jones, Jr. (3ES10)
Jason Gambatese (3WP22)
Richard Rogers (3WP22)

From: Wayne Morganroth, WV BPH, Environmental Chemistry Laboratory
To: Joe Slayton, Technical Director, OASQA
Re: Response to your e-mail to Andrea Labik – WV Lab Certification, 11-21-00.

Dear Joe,

Evidently, you did not receive a copy of our most recent fluoride PT sample that Greg analyzed successfully. We obtained the sample from ERA and when our result was mailed to them a request was made to send a copy to Region III – see copy of the Reporting Cover Sheet. Probably, this request did not contain sufficient information to ensure proper forwarding of the result to the appropriate personnel. To help us rectify this situation for the future, to whom, or to what agency should we have PT results sent?

Incidentally, we were unable to successfully analyze the PT for fluoride by the IC method. Greg has continued to have difficulties in performing satisfactory fluoride analyses with those samples we have obtained from ERA. We obtained a known sample from them and couldn't get a satisfactory analysis, however, he gets good values using the electrode method. Consequently, he reported the fluoride PT using the latter method. A representative from Dionex told Greg that some of the problem, at least, if not all, could be due to the fact that the samples previously obtained from ERA contained calcium hardness. The fluoride PT sample in ERA's WS-52 does not contain hardness as one of the reportable analytes. So, hopefully, we will be able to report fluoride via EPA 300.0.

To answer your further questions/concerns: We are presently in the process of performing a complete (for us) PT from ERA. This is their November InterLab WatR Supply designated as WS-52. This study began November 14, 2000 and terminates December 29, 2000. Since they complete all reports in 21 days (a NELAC requirement I believe) a report of our results should be sent to you or the appropriate person/agency by January 22, 2001. As is usual for our laboratory we will be reporting for the following analytes: trace metals, mercury, chloride, conductivity, fluoride, nitrate-N, nitrite-N, sulfate, TDS, pH, alkalinity and hardness. In 2001 we plan on doing our primary WS study by the end of April and any make-up study by the first of September 2001.

Sincerely,

Wayne

Wayne Morganroth

WS4801

ENVIRONMENTAL RESOURCE ASSOCIATES

WS-48 Data Reporting Cover Sheet

a) LABORATORY INFORMATION

Customer Code: W2134-01

Below is the information we currently have on file for your laboratory. Please note that the address shown below is where ERA will send your final report. If there are any corrections, please fill in the boxes below the appropriate heading.

LAB NAME: Bureau of Public Health, Ols

STATE LAB CODE: Please fill in boxes: 00003C

MAILING ADDRESS: Environmental Chemistry Lab

USEPA LAB CODE: Please fill in boxes: WV00003

4710 Chimney Dr Ste G

PHONE #: 304-558-3530

CITY: Charleston ST: WV ZIP: 25302

FAX #: 000-000-0000: 304-558-4143

EMAIL ADDRESS FOR OFFICIAL LABORATORY CONTACT(optional):

b) Where would you like ERA to send your final WS-48 report?

By participating in ERA's WS-48 study, you will automatically receive a Final Customer Report sent after the study closes. To authorize ERA to send a report to a state, the EPA or a customer, please complete the following Sections.

- ● The attached WS-48 results will be used for accreditation/certification of my laboratory.

If so, please fill in the mark sense bubble to the left and indicate below ALL states in which you are currently accredited/certified.

○ Alabama	○ Iowa	○ New Jersey	○ Vermont	○ EPA Region 6
○ Alaska	○ Kansas	○ New Mexico	○ Virginia	○ EPA Region 7
○ Arkansas	○ Kentucky	○ New York	○ Washington	○ EPA Region 8
○ Arizona	○ Louisiana	○ North Carolina	○ West Virginia	○ EPA Region 9
○ California (NELAC)	○ Maine	○ North Dakota	○ Wisconsin	○ EPA Region 10
○ California (ELAP)	○ Maryland	○ Ohio	○ Wyoming	○ No agency required
○ Colorado	○ Massachusetts	○ Oklahoma	○ Guam	
○ Connecticut	○ Michigan	○ Oregon	○ Puerto Rico	Other? See section (c).
○ Delaware	○ Minnesota	○ Pennsylvania	○ Virgin Islands	
○ Florida	○ Mississippi	○ Rhode Island	○ A2LA	
○ Georgia	○ Missouri	○ South Carolina	○ EPA Region 1	
○ Hawaii	○ Montana	○ South Dakota	○ EPA Region 2	
○ Idaho	○ Nebraska	○ Tennessee	● EPA Region 3	
○ Illinois	○ Nevada	○ Texas	○ EPA Region 4	
○ Indiana	○ New Hampshire	○ Utah	○ EPA Region 5	

Included in the cost of your WS-48 standards is one report sent to your primary state accreditation/certification officer. Additional reports are billed at $10 each.

NVLAP

ENVIRONMENTAL RESOURCE ASSOCIATES®

Study: **WS48**

ERA Laboratory Code: **W2134-01**

Laboratory Name: **BUREAU OF PUBLIC HEALTH, OLS**

Report Type: **National Standards**

Report Method: **Method A**

5540 Marshall St., Arvada, CO 80002 1-800-372-0122 fax 303-421-0159 info@eraqc.com www.eraqc.com

ENVIRONMENTAL RESOURCE ASSOCIATES®

WS-48 Final National Standards Report

ERA Laboratory Code: W2134-01 **EPA ID: WV00003** **State ID:** **Report Issued: 09/14/00**

EPA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description
Metals	Antimony	µg/l		43.2	30.2 - 56.2		
	Arsenic	µg/l		69.3	60.6 - 77.4		
	Barium	µg/l		825	701 - 949		
	Beryllium	µg/l		3.52	2.99 - 4.05		
	Boron	µg/l		584	548 - 640		
	Cadmium	µg/l		38.4	30.7 - 46.1		
	Chromium	µg/l		131	111 - 151		
	Copper	µg/l		582	524 - 640		
	Lead	µg/l		55.8	39.1 - 72.5		
	Manganese	µg/l		170	157 - 179		
	Molybdenum	µg/l		102	85.9 - 117		
	Nickel	µg/l		395	336 - 454		
	Selenium	µg/l		38.3	30.6 - 46.0		
	Thallium	µg/l		7.75	5.43 - 10.1		
	Zinc	µg/l		1410	1300 - 1510		
Mercury	Mercury	µg/l		5.20	3.64 - 6.76		

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ENVIRONMENTAL RESOURCE ASSOCIATES

WS-48 Final National Standards Report

ERA Laboratory Code: W2134-01 EPA ID: WV00003 State ID: Report Issued: 09/14/00

Analyte Group	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description
pH	pH	S.U.		8.40	7.56 - 9.24		
Inorganics	Fluoride	mg/l	6.76	6.80	6.12 - 7.48	Acceptable	SM4500F-C
	Nitrate as N	mg/l		3.88	3.49 - 4.27		
	Sulfate	mg/l		43.2	38.6 - 47.6		
	Total dissolved solids	mg/l		346	224 - 468		
Alkalinity & Sodium	Alkalinity (as CaCO3)	mg/l		43.3	41.1 - 48.7		
	Sodium	mg/l		19.9	18.5 - 21.9		
Turbidity	Turbidity	NTU		5.33	4.69 - 6.32		
Residual Chlorine	Free residual chlorine	mg/l		2.03	1.70 - 2.36		
Nitrite	Nitrite as N	mg/l		1.88	1.60 - 2.16		
Nutrients	ortho-Phosphate as P	mg/l		1.34	1.26 - 1.41		
Cyanide	Cyanide	mg/l		0.190	0.143 - 0.238		
TOC	Total organic carbon	mg/l		4.42	4.00 - 5.05		
Chlorite	Chlorite	µg/l		166	112 - 242		
Bromate & Chlorate	Bromate	µg/l		17.7	4.95 - 32.5		
	Chlorate	µg/l		93.9	75.8 - 112		
Bromide	Bromide	µg/l		256	218 - 297		
Hardness	Calcium Hardness as CaCO3	mg/l		155	145 - 166		

NVLAP

Post-it® brand

Fax Transmittal Memo 7672

To Joe Slayton		From Wayne Morganroth	
Company US EPA, Region III, OASQA		Company WV B. P. H., OLS, Environmental Chem. Lab.	
Location Ft. Meade, Maryland		Location Charleston, WV	Dept. Charge
Fax # 1-410-305-3095	Telephone #	Fax # 1-304-558-4143	Telephone # 1-304=558-0197
Comments Response to 11-21-00 e-mail to Dr. Labik		Original Disposition: ☐ Destroy ☐ Return ☐ Call for pickup	

No. of Pages 6 | Today's Date 11-22-00 | Time

Dave Russell
11/21/00 10:34 AM

To: Joe Slayton/ESC/R3/USEPA/US@EPA
cc:
Subject: Membrane Filter Procedure

Joe,

Here is the last e-mail re WV I sent you. SOPs were the outstanding issue. As of 8/11 I got the last one needed. The had earlier in the year done all the PTs needed for certification.

----- Forwarded by Dave Russell/ESC/R3/USEPA/US on 11/21/00 10:31 AM -----

Dave Russell
08/11/00 04:31 PM

To: Joe Slayton/ESC/R3/USEPA/US@EPA
cc:
Subject: Membrane Filter Procedure

Just a quick update. Got the last SOP! Everything looks good for micro.
----- Forwarded by Dave Russell/ESC/R3/USEPA/US on 08/11/00 04:30 PM -----

tomong@wvdhhr.org
08/11/00 04:08 PM

To: Dave Russell/ESC/R3/USEPA/US@EPA
cc:
Subject: Membrane Filter Procedure

Here it is, the Membrane Filter Procedure. If you need anything else, just let me know.

- Membrane Filter 100 mL.wpd
- Membrane Filter QC 8-2-00.wpd

Tom WV

From: JOE SLAYTON
To: RTPMAINHUB.INTERNET.ROGERS-RICK
Subject: Water Water Everywhere-Two Divisions In Step Making Sure There is Plenty to Drink

Rick: I just wanted to pull together the items we talked about today to avoid any areas in Region 3 SDWA program reviews which are not covered by assessments made by the Regional Water Program Office or the ESD.

1. The analytes for which the State Principal labs are certified are based upon their request. OASQA-ESD laboratory certification officers have no way of verifying that additional analytes should be certified, i.e, they are not aware of waivers of monitoring requirements or analytes, which required monitoring by the State program office, but are farmed out to commercial laboratories.

2. The State Lab Certification Program review performed by OASQA-ESD verifies that the SDWA laboratory certifications are performed in accordance with the SDWA Lab Cert Manual and supporting regulations. The OASQA-ESD assessments do not verify that the State Program Office or the Drinking Water facilities employ only SDWA certified laboratories for compliance analyses.

3. We will continue to downgrade or not certify laboratories for analytes for which samples are not routinely preserved or which are not routinely analyzed within the SDWA required holding time. Routinely flagging such results as not suitable for compliance purposes will not be acceptable. This is consistent with a general requirement of not certifying a laboratory for SDWA unless they actually analyze SDWA samples and the requirement that SDWA laboratories are to have sample acceptance policies. We include these items/issues in the OASQA-ESD inspection reports which are forward to WPD.

Nice doing business with you, JoeS.

CC: LQC, RTPMAINHUB.INTERNET.JONES-CHARLIE, R3PA2.R3WA...

Dave Russell
06/05/02 09:45 AM

To: Tom Ong <tomong@wvdhhr.org>
cc: Joe Slayton/ESC/R3/USEPA/US@EPA
Subject: Re: WV Certification Status

Tom:

We now have a new procedure whereby we follow up with an upgrade letter for those labs that receive provisional certification. Unfortunately, WV was the last lab inspected before this new procedure was implemented; however, an upgrade letter was, in fact, drafted for WV earlier this year. Thought it had been forwarded to you, but apparently not. I have attached a copy. Note the table.

I will sign a hard copy and fed ex it to you.

Let me know, should you need anything else.

Dave Russell
Region III, Microbiology C.O.


WVmicroupdate.wpc

Tom Ong <tomong@wvdhhr.org>

Tom Ong <tomong@wvdhhr.org>
06/04/02 02:45 PM

To: Joe Slayton/ESC/R3/USEPA/US@EPA
cc: Dave Russell/ESC/R3/USEPA/US@EPA
Subject: WV Certification Status

Greetings from WV.

I received an unusual request today. A Federal Prison in WV that we have been doing their drinking water analysis for them, called and requested a copy of our drinking water certification (they were being audited).

I am not real sure what to send them. The labs we certify in WV are provided a certificate and parameter sheet and our milk certification is published quarterly in the "IMS Listing". I've gone back through the folder from our 1999 on-site and the report listed us as "Provisionally Certifed" pending corrective actions. It seems that the last correspondance I have is an e-mail from you to Dr. Labik indicating that all of the corrective actions from the last on-site were completed. I don't recall seeing anything that formally lists our current drinking water certification status.

Please help.

Tom

Certification Update, February 27, 2002

Microbiology

Office of Laboratory Services
Department of Health and Human Resources
Bureau for Public Health
State of West Virginia

by

David E. Russell
Microbiological Assessor

Environmental Protection Agency - Region III
Office of Analytical Services and Quality Assurance
Environmental Science Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

A. Summary:

The corrective actions following the Nov. 1999 on-site inspection have been reviewed. All corrective actions are acceptable. The required PT samples were successfully analyzed and recorded in 2000. In accordance with the concluding paragraph in the original on-site report, full certification is recommended for the methods listed below.

Note that according to 40 CFR 141.74, any laboratory certified for total coliform analysis, is also certified for heterotrophic plate count.

B. Certification Status (Recommended by the Certification Officer):

Organisms	Method and Citation[1]	Certification Status
Total Coliforms, Fecal Coliforms (or *E. coli*)	Colilert, SM 9223	Certified
	Multiple-Tube Fermen., SM 9221B,E	Certified
	Membrane Filtration, SM 9222B	Certified
Heterotrophic Bacteria	Heterotrophic Plate Count, SM 9215B	Certified

C. Assessor

David E. Russell, Ph.D.
Biologist

[1] Standard Methods for the Examination of Water and Wastewater, 19th Edition.

STATE OF WEST VIRGINIA
DEPARTMENT OF HEALTH AND HUMAN RESOURCES

Cecil H. Underwood
Governor

Joan E. Ohl
Secretary

December 13, 2000

Joseph Slayton
Office of Analytical Services
and Quality Assurances
Environmental Sciences Center
701 Mapes Road, 3 ES20
Fort Meade, Maryland 20755-5350

Dear Mr. Slayton:

Enclosed is the QA Manual for the Environmental Chemistry Section at Big Chimney, West Virginia. We welcome comments and suggestions.

I am still working part-time and feel great.

Merry Christmas from

Charlotte B

Dr. Andrea Labik, Dr. Wayne Morganroth
and Charlotte Billingsley

Andrea (Ho! Ho! Ho!)

Wayne

Final Reports

From: JOE SLAYTON
To: in:"andrealabik@wvdhhr.org"
Date: 2/22/00 12:03pm
Subject: Final WV Reports

Dr. Labik: Thanks for you verbal approval of the draft reports last week. Please find attached the electronic copies of the final on-site lab inspection reports (inorganic and microbiology) as well as, the final report on WV's SDWA Lab Certification Program. Signed hard copies of these reports are being pouched to our Regional Office and these will be forwarded as hardcopy under cover letter from the Regional Certification Officer (Stan Laskowski).

We are sending these to you electronically so that your laboratory and SDWA certification officers (with regard to WV's SDWA Lab Cert. Program) can begin making the necessary adjustments/corrective actions.

We request that your response as to corrective actions be provided by March 22, 2000.

Thank you in advance for your assistance in this effort, Joe Slayton

CC: gambatese-jason, jones-charlie,costas-robin, russe...

EPA

Final On-Site Laboratory Evaluation Report (SDWA)

Inorganic Chemistry

(Rev. 2-22-00)

West Virginia Department of Health and Human Resources
Bureau for Public Health
Office of Laboratory Services
Environmental Chemistry Laboratory Section
4710 Chimney Drive, Suite G
Charleston, WV 25302

November 30- December 1, 1999

Surveyed by:

Joseph Slayton
Robin Costas

U.S.E.P.A. - Region III
Office of Analytical Services and Quality Assurance
701 Mapes Road
Ft. Meade, Maryland 20755-5350

A. Introduction:

On November 30, 1999 an on-site inspection of inorganic chemistry was conducted of the West Virginia Department of Health and Human Resources, Bureau for Public Health, Office of Laboratory Services. The analyses of drinking water samples is conducted at a separate location, Environmental Chemistry Laboratory Section, 4710 Chimney Drive, Suite G, Charleston, WV 25302. The purpose of this inspection was to determine the capability of the laboratory to perform its mission as it relates to the Safe Drinking Water Act (SDWA). The laboratory was represented by Dr. Andrea Labik, Sc.D, Office of Laboratory Services Director, Dr. Wayne Morganroth, Laboratory Supervisor, Mr. Larry Duffield, Chemist II (analysis of metals), and Mr. Greg Young, Chemist I (analysis of inorganic, non-metal analytes).

This inspection was conducted by: Robin Costas, Chemist (evaluation of metals) and Joseph Slayton, Associate Director of Science (evaluation of inorganic, non-metals); USEPA, Region III, Office of Analytical Services and Quality Assurance, 701 Mapes Road, Ft. Meade, Maryland 20755-5350. In addition the Office of Municipal Assistance, Water Protection Division was represented by Mr. Jason Gambetese of the Philadelphia Regional Office (EPA).

Since the last on-site laboratory inspection performed by EPA in 1996, the Bureau of Public Health Laboratory has lost the capability to perform the analyses of organic contaminants for SDWA. In addition, the listing in Section E of this report, "Contaminant Method Information" is the subset of regulated and "unregulated" parameters for which the laboratory is requesting SDWA certification. As indicated in Section E, this requested list represents an abbreviated subset of the SDWA contaminants. Also, the Director of the Office of Laboratory Services, Dr. Frank Lambert, Jr. and the Associate Director of the Division of Environmental & Newborn Laboratory Services have both retired. The new Director, Dr. Andrea Labik, was appointed in October 1999. The Associate Division Director position has not yet been filled.

Compliance samples for total nitrate are routinely analyzed and reported as a sum for (NO2+NO3)-N. The State uses a concentration of 0.5 mg/L to "trigger" the immediate resampling and reanalysis, i.e., this may indicate an NO2-N concentration of 0.5 mg/L which has a maximum concentration limit of 0.5 mg/L. This approach will be discussed with the Region III Drinking Water Program Office to assure compliance with SDWA regulations.

B. Personnel:

The courtesy and professionalism of the laboratory personnel was greatly appreciated by the inspection team. It was apparent from the excellent record keeping and quality control procedures, that the laboratory personnel are dedicated to achieving analytical excellence.

C. Proficiency Testing (PT) Samples:

The laboratory data for Proficiency Testing samples for the years 1997 thru 1999 were discussed

during the on-site evaluation. The laboratory results were "Acceptable" for all regulated inorganic parameters reported with the exception of the following "Not Acceptable" results: September 1997-sulfate; March 1998-nitrite, -O-PO4, -sulfate; September 1998- O-PO4 (nitrate and sulfate - acceptable); 1999- fluoride (O-PO4 not analyzed).

The laboratory indicated problems with the equipment used for fluoride (electrode) and imprecision in using the turbidimetric technique for sulfate. The laboratory has stopped using these techniques and is requesting certification for EPA Method 300.0, Ion Chromatography (IC). The laboratory does not perform ortho- phosphorus analyses and is not requesting certification for this analyte. The laboratory results in 1999 by IC was acceptable for sulfate but not acceptable for fluoride by IC. The problem with fluoride was associated with an interference at the beginning of the chromatographic run called the "water dip". The laboratory indicated that this problem had been corrected.

D. Analytical Method References:

The list of parameters in Section E were audited during this inspection with the associated methodology cited as follows:

(SM) - Standard Methods for the Examination of Water and Wastewater, 18th edition.
(EPA83) - Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79/83.
(EPA93) - Determination of Inorganic Substances in Environmental Samples, Aug 1993, EPA/600/R-93/100.
(EPA94) - Methods for the Determination of Metals in Environmental Samples, May 1994, EPA/600/R-94/111.
(CLADW) - Manual for the Certification of Laboratories Analyzing Drinking Water, March 1997, EPA 815-B-97-001.

E. Contaminant Method Information:

Primary Contaminants:

Parameter	Method	Instrumentation
Antimony	GFAAS (SM 3113B)	Varian SpectrAA - 400 Plus
Arsenic	GFAAS (SM 3113B)	Varian SpectrAA - 400 Plus
Barium	ICP (EPA94, 200.7)	Varian Liberty 100
Beryllium	GFAAS (SM 3113B)	Varian SpectraAA - 400 Plus
Cadmium	GFAAS (SM 3113B)	Varian SpectraAA - 400 Plus
Chromium	GFAAS (SM 3113B)	Varian SpectrAA - 400 Plus
Copper	GFAAS (SM 3113B)	Varian SpectrAA - 400 Plus
Lead	GFAAS (SM 3113B)	Varian SpectrAA - 400 Plus
Mercury	Cold Vapor AA (EPA94, 245.1)	PE-50B W/PE CVAAS
Selenium	GFAAS (SM 3113B)	Varian SpectrAA - 400 Plus
Sodium	Flame AA (SM 3111B)	Varian SpectrAA - 400 Plus
Thallium	GFAAS (EPA94, 200.9)	Perkin-Elmer 5100, HGA 600
Fluoride	EPA 300.0	Dionex-120; AS-40 Autosampler

Nitrate	Automated Cadmium (EPA 353.2)	Technicon Auto-Reduction Analyzer II
Nitrite	Automated Cadmium (EPA 353.2)	Technicon Auto-Reduction Analyzer II
Turbidity	Nephelometric (EPA 180.1)	Hach Ratio Turbidimeter Model 2100A
Conductance	Conductance (SM 2510B)	Model 31 Conductivity Bridge

E. Contaminant Method Information (Cont.):

Unregulated Contaminants:

Parameter	Method	Instrumentation
Nickel	GFAAS (SM 3113B)	Varian SpectrAA - 400 Plus

***Secondary Contaminants*:**

Aluminum	GFAAS (SM 3113B)	Varian SpectrAA - 400 Plus
Chloride	EPA 300.0	Dionex-120; AS-40 Autosampler
Iron	Flame AA (SM 3111B)	Varian SpectrAA - 400 Plus
Manganese	Flame AA (SM 3111B)	Varian SpectrAA - 400 Plus
Silver	GFAAS (SM 3113B)	Varian SpectrAA - 400 Plus
TDS	EPA 160.1 Gravimetric	Gelman A/E GF Filters; Blue M Oven; Mettler AG-245
Zinc	Flame AA (SM 3111B)	Varian SpectrAA - 400 Plus
Sulfate	EPA 300.0	Dionex-120; AS-40 Autosampler

F. Calibration & Detection Information:

Maximum Contaminant Level (MCL), Method Detection Limit (MDL), Reporting Limit (RL as defined by the WV Laboratory, See Section I, Metals)

Primary Contaminants; Lead and Copper Rule; Sodium and Turbidity:

Contaminant	***Calibration Standards* (mg/L)**	**MCL(mg/L)**	**MDL(ug/L)**	**RL(ug/L)**
Antimony	BLK; 0.003; 0.006; 0.012	0.006	0.46	3
Arsenic	BLK; 0.002; 0.005; 0.010; 0.020	0.050	0.81	2
Barium	BLK; 0.50; 5.00; 10.0	2.00	0.000135	5
Beryllium	BLK; 0.0002; 0.0005; 0.001; 0.002	0.004	0.04	0.2
Cadmium	BLK; 0.001; 0.002; 0.004	0.005	0.07	1

Primary Contaminants; Lead and Copper Rule; Sodium and Turbidity (Cont.):

Contaminant	*Calibration Standards* (mg/L)	MCL(mg/L)	MDL(ug/L)	RL(ug/L)
Chromium	BLK; 0.001; 0.0025; 0.005; 0.010	0.100	0.37	1
Copper	BLK; 0.001; 0.0025; 0.005; 0.010	1.3*	0.16	1
Lead	BLK; 0.001; 0.0025; 0.005; 0.010	0.015*	0.86	1
Mercury	BLK; 0.0002; 0.0005; 0.001; 0.002	0.002	0.065	0.2
Selenium	BLK; 0.002; 0.005; 0.010	0.050	0.30	2
Sodium	BLK; 2.0; 5.0;10.0;15.0; 20.0;30.0;50.0;100.0	20.0+	0.07	2000
Thallium	BLK; 0.002; 0.004; 0.008	0.002	0.65	1
Fluoride	BLK; 0.05; 0.1; 0.25; 0.50; 1.00	4.0	TBD	50
Nitrate	BLK; 0.05; 0.10; 0.25; 0.50; 1.00	10.0	9.5	50
Nitrite	Cd Column Check Standard (1.0)	1.0	3.6	50
Turbidity	0.2; 0.4; 0.6; 0.8; 1.0 2; 4; 6; 8; 10 NTU	-	-	0.2NTU
Conductance	0.01N (1413 umhos/cm)	-	-	-
TDS	NIST Traceable Std. Wts.	[500]	-	-
Chloride	BLK; 5; 10; 15; 25; 30	[250]	TBD	500
Sulfate	BLK; 1; 4; 10; 20; 30	[250]	TBD	100

---

* "Action Level"
+ "Reportable Level"
"TBD" = To Be Determined

G. Quality Control (QC) Procedures:

The laboratory follows a "Quality Assurance Program Plan for Chemistry Aspects of the West Virginia Bureau for Public Health", (QA Manual, Rev. 1/98). This document includes: instructions for sample submission to the laboratory (containers, preservations, sample handling procedures); instrument calibration; analytical procedures; data reduction; data validation and data reporting; data storage; preventive maintenance; internal QC checks and frequency; corrective action; precision and accuracy samples; and sample rejection policy. A partial list of the QC procedures observed during this inspection included: calibration records for thermometers; on-going temperature records of refrigerators and drying ovens; analysis of an external QC sample with each analytical batch; method detection limit determinations; duplicate analysis (precision measure); spike analysis (accuracy/recovery measure); blank analysis/batch; check standards at 10% frequency (instrument drift measure); instrument "run logs"; cadmium column reduction efficiency measured and recorded; standard weights employed to verify balance performance; detailed/clearly written and quickly retrieved analytical records; and resistance/conductivity of lab pure water recorded each day of use.

H. Analytical Deviations:

Deviations are those laboratory techniques not in compliance with the mandatory requirements of the analytical methods cited above or with the 1997 EPA Manual for the Certification of Laboratories Analyzing Drinking Water, Fourth Edition, EPA/815-B-97-001, (referred to as CLADW). In addition, procedures/techniques, which are considered critical by the inspectors for the production of quality data are cited as "Good Laboratory Practices" (GLP). The following changes are required for the laboratory to maintain in compliance with the SDWA program (40 CFR 142.10):

General:

1. The principle WV state SDWA laboratory must maintain capability and certification for all the contaminants specified in the State Primary Drinking Water Regulations, p. E-1 CLADW, unless the State has been granted wavers for compliance monitoring of these analytes or has contracted with laboratories which are SDWA certified (by EPA or by a state other than WV) for these analytes. A listing of commercial laboratories employed by the State for SDWA compliance monitoring for the analytes not measured at the WV Lab and their current SDWA Certification status (State in which they hold certification, method and analytes) is necessary to complete our records.

2. Many of the QC acceptance/action limits for inorganic-non-metals where fixed limits. However, these criteria were not included in corresponding Standard Operating Procedures (SOPs), e.g., correlation coefficient limit of 0.995 for NO3. The QC limits must be included in the SOP. In addition, the corrective actions to be taken when limits are exceeded should be added to the SOP. The QA Plan only lists a general approach, the SOP needs to list specifics, e.g., stop analysis, take corrective action to correct problem with new reagents, new calibration standards, new pump tubes, new photo multiplier or colorimeter bulb, etc. Also, the SOP should specify that when QC limits are exceeded that all analysis since the last acceptable QC check are to be repeated.

3. Checks of sample preservations, required by CLADW must be recorded, GLP.

4. The laboratory has a Sample Rejection Policy. The laboratory must reject samples not preserved as per CLADW, e.g., turbidity, or the data must be flagged indicated that required preservation was not employed and/or required technical holding times were not met.

ICP Analyses:

5. All samples prepared for ICP analysis must be digested as according to method, ie. the addition of 2 mL (1+1) nitric acid and 1 mL of (1+1) hydrochloric acid. This would translate into 700 uL of nitric acid and 350 uL of hydrochloric acid per 35 mL of sample. (EPA94, 200.7,

11.2.3)

NO2-N & NO3-N:

6. The SOP must be updated to reflect the current EPA methods manual cited by 40 CFR, which is entitled: Determination of Inorganic Substances in Environmental Samples, Aug 1993, EPA/600/R-93/100.

7. Stock calibration solutions must be labeled with the date of preparation, analyst and expiration date. Stock solutions should not be retained more then a month (4C) unless verified to be accurate versus a newly prepared QC sample/ampule, GLP. Similarly, calibration standards are to be prepared fresh with each analytical batch of samples or the accuracy of the standards verified accurate versus a newly prepared QC sample /ampule, GLP.

8. The samples for nitrite-nitrate must be checked and verified free of chlorine or dechlorinating reagent must be added, EPA 353.2, EPA-600/R-93-100, August 1993.

Ion Chromatography (fluoride, chloride, sulfate):

9. Since the last Proficiency Testing sample for fluoride was "Not Acceptable" it is critically important that the laboratory purchase, analyze and forward PT results to EPA which demonstrate "Acceptable" performance, prior to the analysis of additional compliance samples.

10. MDLs have not been determined for the Ion Chromatography (IC) analytes. MDLs are required under SDWA regulations CLADW and EPA Method 300.0

11. An SOP must be prepared for IC analyses, GLP. This can be very brief, with sections referencing EPA Method 300.0 and listing any procedures differing from the referenced method. Where options are listed in the reference method, the SOP must indicate which option/s are actually employed by the laboratory.

12. Samples for sulfate are not refrigerated. Compliance samples are to be transported on ice as per CLADW.

13. An initial demonstration of capability is required for each analyte as per Section 7.2.7 CLADW and as detailed in 300.0.

14. The laboratory has purchased an IC (the first for the lab), but the analyst has not had previous experience with this technology. It is very important that the analyst have formal training available from the instrument manufacturer. It may prove cost effective to host a training course at the WV laboratory (Chimney Drive).

Turbidity:

15. Samples arrive without refrigeration and are held longer then 48 hours. Compliance samples must be maintained at 4C from the time of sampling and analyzed within 48 hour, CLADW.

16. The SOP is dated and does not reference the current required method. The SOP must be updated to reference EPA-600/R-93-100, August 1993.

17. A reagent blank is not analyzed. A blank must be analyzed as per CLADW, however, values below the lowest calibration standard are to be reported as per the current practice (< lowest calibration standard).

Total Dissolved Solids (TDS):

18. Samples are received without refrigeration. Compliance samples for TDS analyses must be maintained at 4C from the time of sampling, CLADW.

Conductance:

19. Samples for conductance are received without refrigeration. Compliance samples for Conductance must be maintained at 4C from the time of sampling, CLADW.

I. Recommendations:

These items are offered as suggestions (not required):

General:

a. It is growing ever more critical that the laboratory managers and staff have access to the Internet. The EPA's web page is a vital source of information, e.g., current and projected SDWA regulations. Much information/communications within Region III are via E-Mail and such contacts are considered critically important to the State's Drinking Water Programs. In addition, since the analysts also serve as SDWA Lab Certification officers, the Internet would be an efficient and effective way to stay in communication with and distribute information to the drinking water laboratories in WV.

b. The QA Manual should be updated to reflect the current analytical procedures. Also, for this update it is recommended that the laboratory consider the sections required by the National Environmental Laboratory Accreditation Conference/Program (NELAC) for a Quality Manual. NELAC is an established program with consensus agreement of over 40 states and is consistent

with international requirements (ISO025) for certification of environmental laboratories. The information for accreditation of WV's Laboratory under NELAC is available in Chapter 5, Quality Systems, of the NELAC standard and the details are available on the NELAC website at www.epa.gov\ttn\nelac. Other specific suggestions include: indication that records will be maintained for at least 5 years; addition of an additional "path" for the corrective action section for when corrective measures do not succeed (e.g., flagging associated data); eliminate corrective action flow chart for organic analytes and add one for inorganic analytes; addition of an organizational chart; reference/s to job description/s; description of training and training plans; list of SOPs; list of signatories for SOPs; requirements for chain-of-custody; list of references, especially for methods; list of tests for which an Initial Demonstration of Capability had been successfully performed.

c. The SOPs are being updated to reflect changes in referenced methods, e.g., NO2+NO3, and changes in technology/method, e.g., IC. It is suggested that the format of the SOP be expanded to include the topics required for method SOPs in the NELAC standards.

d. The ethyl ether stored in the laboratory freezer should be removed. The material may be explosive due to the spontaneous formation of peroxides.

e. The laboratory management should continue in their efforts to replace the vacant Associate Director position. The position is important to the effective coordination and prioritization of the efforts within the Environmental Chemistry and Microbiology Sections. In addition, this position has served to coordinate and oversee WV's SDWA Laboratory Certification Program.

f. An internal peer review should be performed on the inorganic analytical data and the laboratory should begin routine/systematic review/audits of analytical procedures for compliance with the QA manual and the SDWA regulations.

Metals:

g. No value which falls below the calculated MDL should be used in any quality control calculations, ie. do not use these numbers to calculate the Percent Recovery for the Analytical Spike. The concept is that values below the MDL are considered "non-detectable" and, therefore, are not reliable for quality control purposes.

Although, the data being produced is of excellent quality, the reason this is an issue is because of the low Reporting Levels (RL) the analyst is trying to achieve. Some of the MDL levels are very close to the RL and the concern is that the determined MDLs may be biased high for some contaminants. It is suggested that the MDLs be re-analyzed for those contaminants with high MDL levels and low RLs, such as lead, thallium, antimony, chromium. One alternative is to increase the RL (thallium and barium) and extend the linear range of the calibration curve where the Maximum Contamination Level (MCL) will allow.

The following are some excerpts from some documentation which might help clarify issues about the MDL and RL determinations:

> CLADW, 7.2.11: "Laboratories may prefer not to report contaminants at levels less than two to three times their MDL or below the level at which they routinely analyze their lowest standard."
>
> CLADW, H-6, 2.3.3: "Although 40 CFR 136, Appendix B, provides several possible approaches to *selecting an estimated detection limit* (inspector's emphasis) for purposes of designing the MDL study...the most reliable method involves an iterative process of measuring achievability of successively lower concentrations until the actual limit of detection is identified. At a minimum, this approach should be used for purposes of establishing the working MDL when a new method is first used by a laboratory." and "The spike concentration should be determined by the signal to noise ratio for each analyte. The same concentration for all analytes will not produce acceptable results. The extractions/analyses should be performed over a period of at least three days to provide more reasonable MDL."
>
> Guidance for Permit Writer's, Appendix B, 1.1: "The Minimum Level (ML) is a term that originated in the EPA 1600 Series methods, and is defined as the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure..."
>
> Guidance for Permit Writer's, Appendix B, 3.1: "Once the permittee has developed a discharge-specific MDL for each analyte, this MDL is translated into a calculated interim ML by multiplying the discharge-specific MDL by a factor of 3.18. The calculated interim ML is rounded to produce the final interim ML." Although, this definition is from a guidance document for the NPDES program, it does give some explanation on the relationship between the MDL concentrations and what should be an expected quantification level for routine analysis. (National Guidance for the Permitting, Monitoring, and Enforcement of Water Quality-Based Effluent Limitations Set Below Analytical Detection/Quantification Levels, March 22, 1994, EPA Draft document).

h. According to the CLADW (page H-4, section 2.3), the Initial demonstration of Capability (IDC) "consists of demonstrating proficiency in four areas: precision, accuracy (bias), method blank background, and method detection limit." It also suggests that labs "should maintain complete records for the IDC which include the bullet items in the Checklist." The Checklist, found on page H-15, section 2.3, describes an Initial Demonstration of Capability as "a minimum of four replicates of a quality control or reference samples processed through all steps of the analytical procedure."

It is highly recommended that the analyst perform this procedure for each contaminant using a known quality control sample. When four aliquots are digested and analyzed, both precision and accuracy measurements can be determined. All IDC records should be

maintained at the laboratory for future review.

i. The digestion logbook should be self-explanatory and include all relevant information about the particular set of samples and the digestion procedure used. The following are suggested additional column headings which would help clarify the work performed: Digestion Type, Block Temperature, Blanks Digested (y/n), LFB Digested (y/n).

NO2+NO3)-N:

j. The MDL study should be repeated with the spike at or slightly above the concentration of the quantitation range (concentration of the lowest calibration standard). The current MDLs were based on spikes at 0.003 mg/L which were below the lowest calibration standard (0.050 mg/L)

J. Certification Status:

Certified:

Arsenic; Antimony; Barium; Beryllium; Cadmium; Chromium; Copper; Lead; Mercury; Selenium; Sodium; Thallium; Nitrite; Nitrate.

Provisionally Certified:

Fluoride; Turbidity; Conductance.

Secondary Analytes:

Acceptable with Minor Deficiencies (Sulfate; Chloride; TDS).

K. Inspectors:

Joseph Slayton 2-22-00

Joseph Slayton Date

Robin L Costas 2.22.00

Robin Costas Date

Final Microbiology
SDWA Laboratory Evaluation Report
Rev. 2-21-00

Office of Laboratory Services
Department of Health and Human Resources
Bureau for Public Health
State of West Virginia

167 11th Avenue
South Charleston, WV 25303

On-site Evaluation Performed

on

Nov. 29 - Dec. 1, 1999

by

David E. Russell
Microbiological Evaluator

Office of Analytical Services and Quality Assurance
Environmental Science Center
U.S. Environmental Protection Agency, Region III
Ft. Meade, MD 20755-5350

I. Introduction

The microbiology laboratory is currently analyzing drinking and source water for total coliforms using Colilert (MMO-MUG), the Multiple-Tube Fermentation (MTF) technique (100 ml sample volume and bromocresol purple acid indicator), the Membrane Filtration (MF) technique, or Quanti-Tray, each followed by the appropriate procedures for fecal coliforms (or *E. coli*). Heterotrophic Plate Count (HPC) determinations are also performed on lab reagent water using the pour plate method.

Since the last EPA inspection in September of 1996, performance evaluation (PE) samples for total and fecal coliforms (or *E. coli*) have been successfully analyzed using Colilert, MTF, and MF methods in 1997 and 1998. The laboratory analytical staff should be commended for the analytical proficiency demonstrated by this record of PE analyses. PE samples were not analyzed in 1999.

The equipment and procedures employed in the bacteriological analyses of drinking water by this laboratory conform with the provisions of the *Manual for the Certification of Laboratories Analyzing Drinking Water*, 4th Edition (1997, U.S. EPA) , except as described in section III below.

II. Personnel

The following personnel currently analyze drinking and source water for total and fecal coliforms (or *E. coli*) using the Colilert, MTF (100ml volume), MF, or Quanti-Tray methods, and perform HPC analyses on lab reagent water:

Tom Ong
Joyce Vance-Abshire
Mike Flesher
Tracey Bossie
Joe Cochran
Micah Moore

The last three individuals listed have been at the state laboratory less than one year.

The inspector wishes to thank the Microbiology Supervisor, Microbiologists, and Lab Assistants for their cooperation and assistance during the on-site evaluation.

III. Deviations

Deviations from the equipment and analytical procedures in the *Manual for the Certification of Laboratories Analyzing Drinking Water*, 4th Edition (1997, U.S. EPA) are as listed below. Note that all chapter, page, or paragraph numbers and quotes are from the manual.

A. As stated in Chapter III (p.III-4), a laboratory analyzing drinking water should prepare a *written* description of its QA/QC activities (a QA plan), the purpose of which is to "ensure that routinely generated analytical data are scientifically valid and defensible, and are of known and acceptable precision and accuracy." QC procedures are to be specified in SOPs *written* for each method used. Furthermore, it is "the responsibility of the QA manager to keep the QA plan up to date". Although SOPs have been drafted for the Colilert and HPC methods, no SOPs exist for the MTF method (used daily to analyze drinking water) or the occasionally used MF and Quanti-Tray techniques. Nor are there written QA/QC procedures for the use and maintenance of laboratory equipment or general laboratory procedures common to all methods. Therefore, although a few of the elements exist in draft form, there is no complete comprehensive QA plan for drinking water microbiology.

B. Chapter III requires that laboratories, in order to maintain SDWA certification status, analyze PE samples annually. The purpose of this requirement is to confirm that the analytical proficiency of the laboratory is maintained over time despite changes in equipment and personnel that may occur. Although PE samples were successfully analyzed by the Laboratory in 1997 and 1998, none was analyzed in 1999. According to the manual (p. III-7), this omission alone is sufficient basis for downgrading certification status to "provisionally certified".

C. Paragraph 1.2(Chapter V) states that "before analyzing compliance samples, the analyst must demonstrate acceptable results for precision, specificity, and satisfactory analysis on unknown samples." Currently the Laboratory has no record of such a demonstration of analytical proficiency for each new analyst, although other records assessing analyst knowledge are being kept. Note that the above mentioned "unknown samples" could be prepared by the supervisor.

D. The Laboratory should be highly commended for it's practice of rejecting (without analysis) all *drinking water* samples that exceed the 30 hour holding time. *Source water*, however, has a sample holding time of 8 hours (paragraph 6.4 and Surface Water Treatment Rule, 40 CFR 141.74(a)), the purpose of which is to minimize changes in the sample's bacterial assemblage during the period between collection and analysis. Currently this holding time is regularly exceeded because *source water* samples are routinely analyzed the morning after the day they are collected. In addition negative results for the samples that have exceeded the holding time are not flagged as required by paragraph 8.3.5 (as modified in "Errata").

IV. Recommendations

The following remarks are offered as suggestions to help improve the quality and integrity of the data the laboratory generates. Note that all paragraph numbers and quotes are from Chapter V of the *Manual for the Certification of Laboratories Analyzing Drinking Water*, 4th Edition (1997, U.S. EPA).

A. According to paragraph 3.1.5, all pH buffers used "should be dated upon receipt and when opened." Of the three buffer solutions (4.0, 7.0, 10.0) currently in use, two had only the date received marked on them and the third no dates at all. It is recommended as a matter of good laboratory practice that dates received and opened, and the initials of the analyst recording those dates, be marked on all pH buffers in use.

B. According to paragraphs 3.3.2, calibrations of glass and electronic thermometers should be checked annually against an NIST reference thermometer and the results recorded in a log book. Although considerable records of thermometer calibrations were available, they were not organized in such a way as to easily determine the history of calibration of individual thermometers. This problem had been already identified by the Laboratory and a new form or log sheet had been create, but was not yet in use at the time of the on-site visit. One of the new forms will be used for each thermometer; therefore, the record of calibrations for any one thermometer will be readily available. The Laboratory should be commended for this improvement in record keeping.

C. A further improvement in temperature record keeping would be to re-design the temperature recording tables to include the thermometer reading and the corrected temperature for each time the thermometer is read. When only the corrected temperature is recorded, there is no documentation that the analyst actually corrected the thermometer reading with the appropriate correction factor.

D. Regarding records kept for each autoclave, it is recommended that the autoclave for which the records are being kept be clearly indicated on the record form. Although the clip board with the autoclave records hangs next to the relevant autoclave, there is no association recorded on paper between the records and the autoclave.

E. According to paragraph 3.11.5, the "lot number for membrane filters and date received should be recorded." The Laboratory has records of this QC practice up to 1997, but not beyond. The practice should be re-established.

F. Although the Laboratory, pursuant to paragraph 3.14.2, is checking the calibration of each new lot of pre-calibrated test vessels (for Colilert test) and has produced a commendable record documenting this QC practice, it is recommended that the actual volume obtained be

recorded instead of only a check mark. A record of actual volumes would provide raw data that could be assessed independently by other analysts, the microbiology supervisor, or the Laboratory QA officer, and therefore would represent better documentation. Long term trends in test vessel calibration could also be identified.

G. According to paragraph 4.4.3, "each batch of dilution/rinse water should be checked for sterility by adding 50 mL of water to 50 mL of a double strength non-selective broth (e.g., tryptic soy, trypticase soy, or tryptose broth)" and incubated at 35±0.5 °C for 24 hours. If growth occurs entire batch of dilution water should be discarded. At the time of the on-site visit, the Laboratory was not performing this QC sterility check. It is strongly recommended that this QC procedure be performed on all batches of dilution or rinse water, and the results recorded with the other media and dilution water preparation records. Note that if the 50 mL of non-selective broth is sterilized in a typical dilution bottle, the sterility check of the dilution or rinse water can be performed by pouring (with sterile technique) 50 mL of the water into the bottle containing the broth and incubating.

H. It is further recommended that, as matter of good laboratory practice, whenever the pH of a batch of media falls outside the acceptable range, the action taken (e.g., "batch discarded") and analyst's initials be recorded in the media prep log book.

I. Currently when performing the Colilert analysis, the 100 mL±2.5 mL sample test volume is obtained by carefully decanting 100 mL of the sample directly into the sterile IDEXX test vessel and subsequently comparing the volume in the test vessel against a second vessel clearly marked with the acceptable volume range (97.5-102.5 mL). It is recommended that this procedure be improved by doing the comparison at eye-level to make the best evaluation possible. Both bottles should be placed side by side on a platform fixed at eye-level. This recommendation follows what is generally accepted as good laboratory practice when reading any graduated measuring device, such as graduated cylinders or pipettes, i.e., they should always be read at eye-level.

J. Although the laboratory keeps detailed records of all analytical work, including the time an analysis begins, the time any subsequent analyses begins is not recorded. Paragraph 8.4.2 is understood to apply to any subsequent or additional analysis begun after the initial analysis. For example, if a positive MTF test is transferred to BGBB for confirmation, the time of the transfer should be recorded because the BGBB confirmatory test is a new analysis. Likewise if a positive MTF test is also transferred to EC medium for fecal coliforms, the time of transfer should be recorded because it marks the beginning of a new analysis. In other words, it is recommended that for the purpose of quality control, there should be documentation that all tests--presumptive, confirmatory, initial, subsequent, or otherwise--were incubated for the appropriate periods. Documentation on a batch by batch basis would be sufficient.

K. Similarly, it is recommended that for the Colilert analysis the time when the Colilert tests are

read be recorded. This practice would be most important in those cases where a test, following the normal 24 hour incubation, is incubated for an additional 4 hours. The manufacturer cautions that a positive result (yellow color) after incubation for more than 28 hours is not a valid positive. Care should be taken not to incubate samples in excess of 28 hours. (See paragraph 5.6.5.)

L. At the present time, in order to neutralize residual chlorine in a sample, sample bottles are loaded with the appropriate amount of sodium thiosulfate prior to sterilization of the bottle. In addition, when performing the Colilert test, sample is poured into a sterile test vessel that also contains sodium thiosulfate in powdered form. Consequently, residual chlorine is probably being effectively neutralized in all samples analyzed with Colilert. However, with regard to the MTF method, it is possible that in some cases, excessive chlorination is not completely neutralized by the sodium thiosulfate in the sample bottle. It is recommended that a portion of these samples each month (e.g., 10%) be tested with a drop of iodine solution for excess sodium thiosulfate which will be present if all residual chlorine was neutralized. The iodine drop test could be easily performed (by a second analyst) on the sample water remaining in the collection bottle once the 100 mL test volume was removed. The sodium thiosulfate reacts with the iodine to produce sodium tetrathionate and sodium iodide both of which are colorless; consequently the amber color produce by the drop of iodine quickly disappears. If sodium thiosulfate is not present the amber color remains. A similar recommendation was made in 1996.

M. Currently water samples are collected in unmarked bottles and sent to the laboratory with the collection form wrapped around the bottle. Once the unmarked bottle containing the sample arrives in the laboratory, the identity of the bottle and sample depends entirely on the collection form staying with the sample. Because there is no unique identifier (such as a number) on the bottle, there is always the risk of losing the identity of the sample should the collection form and sample become separated. It is recommended that each sample bottle be marked (using an indelible ink marker) with a unique number that is recorded on the sample collection form by the collector. This procedure would insure that all collection information is clearly associated with a sample whether the collection form is kept with the sample or not.

V. Conclusions

The Laboratory's analysts are to be commended for their knowledge of methods and demonstrated commitment to a high level of quality control. Although the on-site evaluation is overall positive, it is recommended that due to the failure to analyze PE (Performance Evaluation) samples in 1999 (see deviation "B" above and Chapter III, p.III-7), the Laboratory's certification status be downgraded to "provisionally certified". Successful analysis of PE samples annually is an essential requirement (as is a favorable on-site evaluation) for maintaining full certification. If EPA receives confirmation that PE samples have been successfully analyzed for total coliform and fecal coliform (or *E. coli*) bacteria, and satisfactory corrective actions are

developed for the other deviations, the Laboratory will be recommended for full certification under the Safe Drinking Water Act.

David E. Russell 2/22/00

David E. Russell Date
Microbiological Evaluator

Closeout Letter

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MARYLAND 20755-5350

November 21, 2000

Andrea M. Labik, SC.D.
Director
West Virginia Department of Health and Human Resources
Office of Laboratory Services
Environmental Chemistry Laboratory
Charleston, West Virginia

Re: SDWA Certification Status of the West Virginia Laboratory.

Dear Dr. Labik:

Our records indicate all corrective actions from the last on-site inspection were completed. The last issue was for microbiology SOP updates which were completed back in August 2000. However, to update our certification records please provide your laboratory's Proficiency Testing (PT) sample results on the last study/ies completed since November 1999. Our records indicate a critical need to successfully complete a PT for fluoride and the other anions.

Sincerely,

Joseph Slayton
Technical Director OASQA

cc: David Russell
Robin Costas
Charles Jones, Jr. (3ES10)
Richard Rogers (3WP22)

Corrective Actions

March 28, 2000

Joseph Slayton
Associate Director Science
U.S. E. P. A. - Region III
Office of Analytical Services and
Quality Assurance
701 Maple Road
Fort Meade, Maryland 20755-5350

Dear Mr. Slayton:

I would like to thank you and your team for the thorough and professional on-site review of the West Virginia SDWA Laboratory Certification Program and the inspections of the inorganic chemistry and microbiology laboratories. Dr. Morganroth and Mr. Ong have prepared responses to specific items listed in their separate reports, particularly with regard to the proficiency testing, on-site laboratory inspections and documentation. I have addressed the issues of the Internet, personnel and NELAC.

Internet: The WVLCP has not had routine access to the Internet. It is growing ever more critical that the COs have access to the Internet. The EPA's web page is a vital source of information, e.g., current and projected SDWA regulations. Much information/communications within Region III are via E-Mail and such contacts are considered critically important to the Region III States' Drinking Water Programs. The Internet would be an efficient and effective way to stay in communication with and distribute information to the drinking water laboratories in West Virginia. The laboratories should be encouraged to have access to the Internet-most will have some mode of access.

Response: The Bureau for Public Health (BPH) realizes that electronic mail is a key component for coordination and communications and realizes that a significant portion of its employees do not have the ability to disseminate information electronically. The Commissioner's office has prepared a strategic plan to provide the Bureau with a multi-year blueprint for information technology. It is envisioned that during the next twelve months, a Wide Area Network will be implemented which will provide connectivity for the Bureau offices in South Charleston and Big Chimney.

Personnel: Given that Dr. Morganroth alone can certify laboratories to perform organic analyses in West Virginia, it is critically important to the WV Laboratory Certification Program to assure that Mr. Larry Duffield and Mr. Greg Young are approved as Certification Officers for organic chemistry, as well as inorganic chemistry as soon as possible. In addition, since the Associated Director position serves as the central focal point for the WV Lab Certification Program, it is important that this vacancy be filled as soon as possible. The WV Laboratory Certification Program may benefit from the selection of an Associated Division Director with experience in SDWA related chemistry (especially organic chemistry).

The WVLCP should consider the benefits of providing administrative/clerical support to the

chemistry and microbiology laboratory certification efforts, since the chemists and microbiologists are spending considerable time tracking and filing information. A part-time aide/clerk may benefit the program.

Response: It is planned that Mr. Larry Duffield will attend the EPA CO's training course in 2000 and Mr. Greg Young will attend in 2001. I have spoken to Dr. Taylor about filling the Associate Director position with someone who has experience in SDWA related chemistry. He supports this approach, however, the actual posting and filling of the Associate Director position has been put on hold until the details of the FY 2001 budget are known. If we are financially able, we hope to recruit and fill this position by July 1, 2000. While we agree that a part-time aide/clerk would benefit the program, we are unable to fund such a person at this time.

NELAC: As described previously, the WV's Laboratory Certification Program for Chemistry should be reflected in a detailed QA Manual as currently available for the Microbiology Certification Program. Also, for this update it is recommended that the laboratory consider the sections required by the National Environmental Laboratory Accreditation Conference/Program (NELAC) for a Quality Manual. The WVLCP certification manual for microbiology already is patterned after NELAC. NELAC is an established program with consensus agreement of over 40 states and NELAC standards are consistent with international requirements for certifications of environmental laboratories, e.g., ISO 25. Information necessary for the WVLCP to apply to have its SDWA laboratory certification program approved by NELAC is available in Chapter 6, Accreditation Authorities, of the NELAC standard and the details are available on the NELAC web site at www.epa.gov\tnn\nelac. Whether WV decides to actually become an Accreditation Authority and offer Lab NELAC Accreditation or not, the items listed in the NELAC standards should further help assure a quality laboratory inspection program for West Virginia.

Response: Dr. Morganroth is currently updating the QA Manual for the Certification Program for Chemistry and will make an effort to pattern this after NELAC. While there is support in the BPH for the WVLCP to have its SDWA laboratory certification program approved by NELAC, we do not have the finances or the trained personnel to seek such approval at this time.

I hope I have adequately responded to your concerns. If you need further clarification, please feel free to contact me.

Very truly yours,

Andrea M. Labik, Sc.D.
Director

3/29/00

CORRECTIVE ACTION PLAN

IN

RESPONSE

TO

LABORATORY EVALUATION REPORT

(SDWA)

ON-SITE EVALUATION

November 30 – December 1, 1999

BY

Office of Analytical Services and Quality Assurance

FROM

WEST VIRGINIA DEPARTAMENT OF HEALTH & HUMAN RESOURCES

OFFICE OF LABORATORY SERVICES

ENVIRONMENTAL CHEMISTRY LABORATORY

CHARLESTON, WEST VIRGINIA

Inorganic Chemistry

H. Analytical Deviations:

METALS ANALYSES

ICP Analyses:

5. All samples prepared for ICP analysis must be digested as according to method, ie., the addition of 2 mL (1+1) nitric acid and 1 mL of (1+1) hydrochloric acid. This would translate into 700uL of nitric acid and 350 uL of hydrochloric acid per 35 mL of sample (EPA94, 200.7, 11.2.3).

Response:

The ICP method EPA94, 200.7, calls for a purposeful matrix mismatch between standards and digested samples with twice as much HCl in the standards. No explanation is given in the method nor was one given during the inspection. Our lab has been adding the same amount of acids to samples as standards to effect a 2% + 2% acid matrix (nitric + hydrochloric) to obviate any problems from trace contaminants and/or physical interferences as described in paragraph 4.2 of the method. We will, however, comply with the method per your order and make digested samples have a 2% + 1% (nitric + hydrochloric) acid matrix. We would appreciate, also, an explanation as to why this method requires a mismatching of acid matrices, as it seems to make no sense from a purely chemical standpoint.

I. Recommendations:

METALS ANALYSES

g. No value which falls below the calculated MDL should be used in any quality control ccalculations, ie., do not use these numbers to calculate the Percent Recovery for the Analytical Spike. The concept is that values below the MDL are considered "non-detectable" and, therefore, are not reliable for quality control purposes.

Response:

Values below MDL will no longer be used in calculating data. After

investigation, it was found that the instrument can be programmed to calculate analytical spikes without subtracting readings of unspiked samples if it is below the MDL. Also, MDLs of the elements in question (Pb, Tl, Sb, Cr) will be re-analyzed using instructions and suggestions given. If Reporting Levels need to be raised , then that will be done also.

h. According to the CLADW (page H-4, section 2.3), the Initial Demonstration of Capability (IDC) "consists of demonstrating proficiency in four areas: precision, accuracy (bias), method blank background, and method detection limit." It also suggests that labs "should maintain complete records for the IDC which include the bullet items in the Checklist." The Checklist, found on page H-15, section 2.3, describes an IDC as a "minimum of four replicates of a quality control or reference sample processed through all steps of the analytical procedure."

Response:

Our laboratory is in the process of complying with this new requirement of IDC as discussed. We are digesting a known QCS in four aliquots and analyzing for precision and accuracy. Results will be kept on file.

i. The digestion logbook should be self-explanatory and include all relevant information about the particular set of samples and the digestion procedure used.

Response:

The metals digestion logbook has been revised to reflect your suggestion. Headings now are as follows: Lab #, Digestion Type, Block Temp., Blank Digested (y/n), LFB Digested (y/n), Date Acidified, pH < 2 (y/n), Date Digested, Digestion Aliquot Volume Checked (y/n), Chemist Initials.

West Virginia Corrective Action Report to Laboratory Evaluation Report (SDWA)
On-Site Evaluation 11/30/99-12/1/99 By EPA – Region III, Office of Analytical Services and Quality Assurance

INORGANIC, NON-METALS

General

DEVIATION: Many of the QC acceptance/action limits for inorganic-non-metals where fixed limits. However, these criteria were not included in corresponding SOPs, e.g., correlation coefficient limit of 0.995 for NO3. The QC limits must be included in the SOP. In addition, the corrective actions to be taken when limits are exceeded should be added to the SOP. QA Plan only lists general approach, the SOP needs to list specifics, e.g., stop analysis, take corrective action to correct problem (new reagents, new calibration standards, new pump tubes, new photo multiplier or colorimeter bulb) and repeat all analysis since the last acceptable QC check, etc.

OLS RESPONSE: *Corrected as described.*

DEVIATION: Checks of sample Preservation, required by CLADW must be recorded, GLP.

OLS RESPONSE: *A pH log book is maintained for Nitrate-Nitrite analyses. Sample temperature is now recorded on a log in and holding time sheet. This laboratory only acccepts samples requested over the phone for hydrogen sulfide analyses. The zinc acetate used as a preservative in hydrogen sulfide analyses is added to a 500 ml dark nalgene bottle at the laboratory prior to shipping it to the customer.*

DEVIATION: The laboratory has a Sample Rejection Policy. The laboratory must reject samples not preserved as per CLADW, e.g., turbidity, or the data must be flagged indicated that required preservation was not employed and/or required technical holding times were not met.

OLS RESPONSE: *A notice is sent with the report that states the values are not valid for compliance monitoring when the sample is not received on ice.*

Combined Nitrate-Nitrite

DEVIATION: The SOP must be updated to reflect the current EPA methods manual cited by 40 CFR, which is entitled: Determination of Inorganic Substances in Environmental Samples, Aug 1993, EPA/600/R-93/100.

OLS RESPONSE: *The SOP is now based on EPA method 353.2 Determination of Nitrate-Nitrite Nitrogen by Automated Colorimetry, revision 2.0 August 1993 and all the quality control limits have been included.*

DEVIATION: Stock calibration solutions must be labeled with the date of preparation, analyst and expiration date. Stock solutions should not be retained more then a month unless verified to be accurate versus a newly prepared QC sample/ampule, GLP. Similarly, calibration standards are to be prepared fresh with each analytical batch of samples or the accuracy of the standards verified accurate versus a newly prepared QC sample/ampule, GLP.

***OLS RESPONSE**: Corrected as described.*

DEVIATION: The samples for nitrate-nitrite must be checked and verified free of chlorine or dechlorinating reagent added. EPA 353.2, EPA-600/R-93-100, Aug 1993.

***OLS RESPONSE**: 50 µL of Sodium Thiosulfate (30 g/L) is added to every 50 ml of sample.*

Ion Chromatography (Fluoride, Chloride, Sulfate)

DEVIATION: Since the last Proficiency Testing sample for fluoride was "Not Acceptable" it is critically important that the laboratory purchase, analyze and forward PT results to EPA, which demonstrate "Acceptable" performance, prior to the analysis of additional compliance samples.

***OLS RESPONSE**: Ken Kirkbride a technical specialist from Dionex suggested the peak threshold be decreased and the method re-optimized to help identify the fluoride peak area correctly. Fluoride quality control samples from VHG LABS have been analyzed with a recovery of 100 ± 10 %. PE samples from ERA will be ordered by the end of April.*

DEVIATION: MDLs have not been determined for the IC analytes. MDLs are required under SDWA regulations CLADW and EPA 300.0

***OLS RESPONSE**: MDL Study will be completed within the next 2 months.*

DEVIATION: An SOP must be prepared for IC analyses, GLP.

***OLS RESPONSE**: A SOP is currently being worked on.*

DEVIATION: Samples for sulfate are not refrigerated. Compliance samples are to be transported on ice as per CLADW.

***OLS RESPONSE**: A notice is sent with the report that states the values are not valid for compliance monitoring when the sample is not received on ice.*

DEVIATION: An initial demonstration of capability is required for each analyte as per section 7.2.7 CLADW and as detailed in 300.0

***OLS RESPONSE**: In the process of being corrected as described.*

Turbidity

DEVIATION: Samples arrive without refrigeration and are held longer then 48 hours. Compliance samples must be maintained at 4°C from the time of sampling and analyzed within 48 hours, CLADW.

West Virginia Corrective Action Report to Laboratory Evaluation Report (SDWA)
On-Site Evaluation 11/30/99-12/1/99 By EPA – Region III, Office of Analytical Services and Quality Assurance

***OLS RESPONSE**: A notice is sent with the report that states the values are not valid for compliance monitoring when the sample is not received on ice. Analyses are performed within the required time.*

DEVIATION: The SOP is dated and does not reference the current required method. The SOP must be updated to reference EPA-600/R-93-100, Aug 1993.

***OLS RESPONSE**: The SOP is currently being updated to reflect EPA method 180.1 Determination of Turbidity by Nephelometry Revision 2.0 August 1993.*

DEVIATION: A reagent blank is not analyzed. A blank must be analyzed as per CLADW.

***OLS RESPONSE**: Corrected as described.*

Total Dissolved Solids

DEVIATION: Samples are received without refrigeration. Compliance samples for TDS analyses must be maintained at 4°C from the time of sampling, CLADW.

***OLS RESPONSE**: A notice is sent with the report that states the values are not valid for compliance monitoring when the sample is not received on ice.*

Conductance

DEIVATION: Samples are received without refrigeration. Compliance samples for conductance analyses must be maintained at 4°C from the time of sampling, CLADW.

***OLS RESPONSE**: A notice is sent with the report that states the values are not valid for compliance monitoring when the sample is not received on ice.*

General Recommendations

RECOMMENDED: The SOPs are being updated to reflect changes in referenced methods, e.g., NO2-NO3, and changes in technology / method, e.g., IC. It is suggested that the format of the SOP be expanded to include the topics required for the method SOPs in the NELAC standards.

***OLS RESPONSE**: The SOP for Nitrate-Nitrite, Alkalinity, Calcium Hardness, Total Hardness and Total Dissolved Solids have been updated as described. The SOPs for the remaining analytes are being working on.*

RECOMMENDED: The Nitrate-Nitrite MDL study should be repeated with the spike at or slightly above the concentration of the quantitation range.

***OLS RESPONSE**: A new MDL was performed on Feb. 17, 2000 with a RFW of 0.008 mg/L NO_3.*

Post-it® brand

Fax Transmittal Memo 7672

To: Joseph Slayton		No. of Pages: 15	Today's Date: 3-29-00
From: Wayne Morganroth			Time:
Company: EPA - Region III, OASQA		Company: WV DHHR, Off P. H., Env. Chemistry Lab	
Location: Ft. Meade, Md.		Location: Charleston, WV	Dept. Charge:
Fax #: 1-410-305-3095	Telephone #:	Fax #: 1-304-558-4143	Telephone #:
Comments: Copy of Corrective Action Plan to 11-30-99 through 12-2-99 on-site inspection evaluation.		Original Disposition: ☐ Destroy ☐ Return ☐ Call for pickup	

NOTE: April 14 2000
not available
Electronic
(ask Don D to scan)

Updates

April 14, 2000

Andrea M. Labik, Sc. D.
Director
West Virginia Department of Health & Human Resources
Office of Laboratory Services
Environmental Chemistry Laboratory
Charleston, West Virginia

Re: Comments on the March 29, 2000 report entitled "Corrective Action Plan in Response to Laboratory Evaluation Report (SDWA) On-Site Evaluation" (Inorganic Chemistry and Microbiology), November 30-December 1, 1999 and "Corrective Action Plan in Response to SDWA Lab Certification program On-Site Review", December 1-2, 1999.

Dear Dr. Labik:

Thank you for the very positive response detailing correction actions from the on-site SDWA laboratory assessment. Our inspection Team greatly appreciated the professionalism and assistance you and your staff provided during the inspection. We applaud and encourage your plans and efforts to bring your laboratory facilities Internet access. Also, we are hopeful that additional assistance and coordination will be provided by filling the vacant Associate Director position. In terms of the corrective actions planned by the WV, we offer the following comments **(the items which are bolded and in enlarged font require additional consideration):**

Inorganic Chemistry:

General

1. The principle WV state SDWA laboratory must maintain capability and certification for all the contaminants specified in the State Primary Drinking Water Regulations, p. E-1 CLADW, unless the State has been granted wavers for compliance monitoring of these analytes or has contracted with laboratories which are SDWA certified (by EPA or by a state other than WV) for these analytes. A listing of commercial laboratories employed by the State for SDWA compliance monitoring for the analytes not measured at the WV Lab and their current SDWA Certification status (State in which they hold certification, method and analytes) is necessary to complete our records.

WV response: The response from WV did not address this finding. However, this has been discussed with Richard Rogers, EPA Region 3 Water Protection Division, who indicated that this is already part of checked either as part of the Regional review and reviews performed by EPA HQ and is not an issue for the WV's State laboratory. **No additional response is necessary**.

2. Many of the QC acceptance/action limits for inorganic-non-metals where fixed limits. However, these criteria were not included in corresponding Standard Operating Procedures (SOPs), e.g., correlation coefficient limit of 0.995 for NO3. The QC limits must be included in the SOP. In addition, the corrective actions to be taken when limits are exceeded should be added to the SOP. The QA Plan only lists a general approach, the SOP needs to list specifics, e.g., stop analysis, take corrective action to correct problem with new reagents, new calibration standards, new pump tubes, new photo multiplier or colorimeter bulb, etc. Also, the SOP should specify that when QC limits are exceeded that all analysis since the last acceptable QC check are to be repeated.

WV response: Clear and acceptable.

3. Checks of sample preservations, required by CLADW must be recorded, GLP.

WV response: Clear and acceptable.

4. The laboratory has a Sample Rejection Policy. The laboratory must reject samples not preserved as per CLADW, e.g., turbidity, or the data must be flagged indicated that required preservation was not employed and/or required technical holding times were not met.

WV Response: Data flagged to client as "not valid for compliance".

ICP Analyses:

5. All samples prepared for ICP analysis must be digested as according to method, i.e. the addition of 2 mL (1+1) nitric acid and 1 mL of (1+1) hydrochloric acid. This would translate into 700 uL of nitric acid and 350 uL of hydrochloric acid per 35 mL of sample. (EPA94, 200.7, 11.2.3)

WV Response: Acceptable.

EPA Assessor Comment: According to Ted Martin, EPA NERL, the acid concentrations specified in method 200.7 for the ICP standards were dictated by the ICP-MS technique, not for the ICP-AES, since only one sample preparation procedure (200.2) is used for both analtyical techniques. Using the different acid concentration (2%+2%, 2%+1% and even 1% HNO3 only) for the standards for ICP_AES analysis is not considered a problem. There should not be any detectable differences in the data. Therefor if the laboratory would rather keep the acid concentrations consistent with the sample matrix, this is acceptable, as long as, all QC checks are within acceptance limits.

NO2-N & NO3-N:

6. The SOP must be updated to reflect the current EPA methods manual cited by 40 CFR, which is entitled: Determination of Inorganic Substances in Environmental Samples, Aug 1993, EPA/600/R-93/100.

WV response: Clear and acceptable.

7. Stock calibration solutions must be labeled with the date of preparation, analyst and expiration date. Stock solutions should not be retained more then a month (4C) unless verified to be accurate versus a newly prepared QC sample/ampule, GLP. Similarly, calibration standards are to be prepared fresh with each analytical batch of samples or the accuracy of the standards verified accurate versus a newly prepared QC sample /ampule, GLP.

WV response: Clear and acceptable.

8. The samples for nitrite-nitrate must be checked and verified free of chlorine or dechlorinating reagent must be added, EPA 353.2, EPA-600/R-93-100, August 1993.

WV response: 50 ul of 30 g/L of thiosulfate is added to every 50 mL of sample is acceptable.

EPA Assessor comment: The laboratory should check for residual chlorine to verify that the samplers have not rinsed out the preservative.

Ion Chromatography (fluoride, chloride, sulfate):

9. Since the last Proficiency Testing sample for fluoride was "Not Acceptable" it is critically important that the laboratory purchase, analyze and forward PT results to EPA which demonstrate "Acceptable" performance, prior to the analysis of additional compliance samples.

WV response: Clear and acceptable. **Please forward a copy of these results to the inspector to complete the file.**

10. MDLs have not been determined for the Ion Chromatography (IC) analytes. MDLs are required under SDWA regulations CLADW and EPA Method 300.0

WV response: Clear and acceptable. **Please forward a copy of these results to the inspector to complete the file.**

11. An SOP must be prepared for IC analyses, GLP. This can be very brief, with sections referencing EPA Method 300.0 and listing any procedures differing from the referenced method. Where options are listed in the reference method, the SOP must indicate which option/s are actually employed by the laboratory.

WV response: Clear and acceptable. **Please forward a copy of these results to the**

inspector to complete the file.

12. Samples for sulfate are not refrigerated. Compliance samples are to be transported on ice as per CLADW.

WV Response: **Data flagged to client as "not valid for compliance".**

This issue has been discussed with the Region 3 Water Protection Division. This is not considered an acceptable response, i.e., only acceptable if this is a rare occurrence, verus the routine for compliance samples. As a consequence the recommended certification status is "Not Certified" with regard to turbidity, conductance and "Not Acceptable" for the secondary analytes, sulfate and TDS.

13. An initial demonstration of capability is required for each analyte as per Section 7.2.7 CLADW and as detailed in 300.0.

WV response: Clear and acceptable. **Please forward a copy of these results to the inspector to complete the file.**

14. The laboratory has purchased an IC (the first for the lab), but the analyst has not had previous experience with this technology. It is very important that the analyst have formal training available from the instrument manufacturer. It may prove cost effective to host a training course at the WV laboratory (Chimney Drive).

WV response: **Did not address this issue. Please forward response.**

Turbidity:

15. Samples arrive without refrigeration and are held longer then 48 hours. Compliance samples must be maintained at 4C from the time of sampling and analyzed within 48 hour, CLADW.

WV Response: **Data flagged to client as "not valid for compliance"**

This issue has been discussed with the Region 3 Water Protection Division. This is not considered an acceptable response, i.e., only acceptable if this is a rare occurrence, verus the routine for compliance samples. As a consequence the recommended certification status is "Not Certified" with regard to turbidity, conductance and "Not Acceptable" for the secondary analytes, sulfate and TDS.

16. The SOP is dated and does not reference the current required method. The SOP must be

updated to reference EPA-600/R-93-100, August 1993.

WV response: Clear and acceptable. **Please forward a copy of these results to the inspector to complete the file.**

17. A reagent blank is not analyzed. A blank must be analyzed as per CLADW, however, values below the lowest calibration standard are to be reported as per the current practice (< lowest calibration standard).

WV response: Clear and acceptable.

Total Dissolved Solids (TDS):

18. Samples are received without refrigeration. Compliance samples for TDS analyses must be maintained at 4C from the time of sampling, CLADW.

WV Response: **Data flagged to client as "not valid for compliance"**

This issue has been discussed with the Region 3 Water Protection Division. This is not considered an acceptable response, i.e., only acceptable if this is a rare occurrence, verus the routine for compliance samples. As a consequence the recommended certification status is "Not Certified" with regard to turbidity, conductance and "Not Acceptable" for the secondary analytes, sulfate and TDS.

Conductance:

19. Samples for conductance are received without refrigeration. Compliance samples for Conductance must be maintained at 4C from the time of sampling, CLADW.

WV Response: **Data flagged to client as "not valid for compliance"**

This issue has been discussed with the Region 3 Water Protection Division. This is not considered an acceptable response, i.e., only acceptable if this is a rare occurrence, verus the routine for compliance samples. As a consequence the recommended certification status is "Not Certified" with regard to turbidity, conductance and "Not Acceptable" for the secondary analytes, sulfate and TDS.

General Recommendations

WV Response: Clear and acceptable

Certification Status: Based upon the WV responses and discussions with Region 3 Water Protection Division, the recommended certification status is as follows:

Certified:

Arsenic; Antimony; Barium; Beryllium; Cadmium; Chromium; Copper; Lead; Mercury; Selenium; Sodium; Thallium; Nitrite; Nitrate and Fluoride.

Not Certified (concerns with accuracy associate with improper preservation, i.e., not refrigerated): Turbidity, Conductance

Secondary Analytes:

Acceptable: Chloride

Not Acceptable (with major concerns with accuracy associated with improper preservation, i.e., not refrigerated): Sulfate and TDS.

K. Inspectors:

Joseph Slayton 4/14/00
Joseph Slayton Date

Robin Costas 4/14/00
Robin Costas Date

Response to an
SDWA Laboratory Evaluation Report
of the
Office of Laboratory Services
Department of Health and Human Resources
Bureau for Public Health
State of West Virginia
167 - 11th Avenue
South Charleston, WV 25303

On-site Evaluation Performed
on
November 29 - December 1, 1999
by

David E. Russell
Microbiological Evaluator

Office of Analytical Services and Quality Assurance
Environmental Science Center
U.S. Environmental Protection Agency, Region III
Ft. Meade, MD 20755-5350

Response by
Thomas L. Ong, Microbiologist Supervisor
Laboratory Certification Officer
Date of Response: March 28, 2000

Follow-Up Comments by
David E. Russell
Microbiological Evaluator

Date of Comments: April 14, 2000

I. Response to Deviatons

A. As stated in Chapter III (p.III-4), a laboratory analyzing drinking water should prepare a *written* description of its QA/QC activities (a QA plan), the purpose of which is to "ensure that routinely generated analytical data are scientifically valid and defensible, and are of known and acceptable precision and accuracy." QC procedures are to be specified in SOPs *written* for each method used. Furthermore, it is "the responsibility of the QA manager to keep the QA plan up to date". Although SOPs have been drafted for the Colilert and HPC methods, no SOPs exist for the MTF method (used daily to analyze drinking water) or the occasionally used MF and Quanti-Tray techniques. Nor are there written QA/QC procedures for the use and maintenance of laboratory equipment or general laboratory procedures common to all methods. Therefore, although a few of the elements exist in draft form, there is no complete comprehensive QA plan for drinking water microbiology.

WV Response: *The QA Plan/SOP is a number one priority and different parts are currently in the works. For example, the Quanti Tray procedure is now finalized and the MTF method is in the works along with the "QA Forms" section and a General QA Section on Equipment and Reagents. A recent phone conversation with Joe Slayton indicated that only the Drinking Water Certification Program - Microbiology section of the manual made the return voyage back to Ft. Meade. The missing parts will be copied and sent Fed Ex this week and as other parts are completed they will also be forwarded.*

EPA Comment: **The QA Plan/SOP is still needed and when completed needs to be forward to the assessor to complete the record.**

B. Chapter III requires that laboratories, in order to maintain SDWA certification status, analyze PE samples annually. The purpose of this requirement is to confirm that the analytical proficiency of the laboratory is maintained over time despite changes in equipment and personnel that may occur. Although PE samples were successfully analyzed by the Laboratory in 1997 and 1998, none was analyzed in 1999. According to the manual (p. III-7), this omission alone is sufficient basis for downgrading certification status to "provisionally certified".

WV Response: *Since the on-site evaluation, the laboratory was participated in ERA's WS41, on January 10, 2000 for the MTF (100 mL) procedure; WS42, on January 18, 2000 for the Colilert (100 mL) procedure; and WS43 on February 22, 2000 for the Membrane Filter Procedure. In all studies, ERA is to forward a copy of the report to EPA Region III. Currently, the only results that have been received are for WS41 in which all were acceptable. I have compared our results for WS42 to the results listed on*

ERA's internet site - they too appear to be all Accetpable, although we are still awaiting the final report.

If you are not receiving copies of these reports, they may be being sent to Charlie Jones at the Philadelphia office. If you need me to forward these to you, please let me know.

EPA Comment: **The EPA Assessor has contacted the PT provider directly and is awaiting these results. Once "acceptable" PT results have been received the certification status will be upgraded.**

C. Paragraph 1.2(Chapter V) states that "before analyzing compliance samples, the analyst must demonstrate acceptable results for precision, specificity, and satisfactory analysis on unknown samples." Currently the Laboratory has no record of such a demonstration of analytical proficiency for each new analyst, although other records assessing analyst knowledge are being kept. Note that the above mentioned "unknown samples" could be prepared by the supervisor.

WV Response: *At the time of the on-site evaluation. "new analysts" referred to Joe Cochran, Tracy Bossie and Micah Moore. Since then, Micah Moore has left. Joe and Tracy both have successfully examined 10 unknown samples for both the MTF and Colilert procedures. This practice is now in place for all new analysts that are hired.*

EPA Comment: Acceptable

D. The Laboratory should be highly commended for it's practice of rejecting (without analysis) all *drinking water* samples that exceed the 30 hour holding time. *Source water*, however, has a sample holding time of 8 hours (paragraph 6.4 and Surface Water Treatment Rule, 40 CFR 141.74(a)), the purpose of which is to minimize changes in the sample's bacterial assemblage during the period between collection and analysis. Currently this holding time is regularly exceeded because *source water* samples are routinely analyzed the morning after the day they are collected. In addition negative results for the samples that have exceeded the holding time are not flagged as required by paragraph 8.3.5 (as modified in "Errata").

WV Response: *The majority of source water samples are received in the mail so the 8 hours holding time is exceeded. Source waters that are received the day they are collected are analyzed the same day (within 8 hours).*

All samples that are received exceeding 8 hours are still analyzed; however, the report forms are now mark as "EXCEEDED 8 HOURS - INVALID" in the

"Laboratry Remarks" section.

EPA Comment: Acceptable

II. Response to Recommendations

A. According to paragraph 3.1.5, all pH buffers used "should be dated upon receipt and when opened." Of the three buffer solutions (4.0, 7.0, 10.0) currently in use, two had only the date received marked on them and the third no dates at all. It is recommended as a matter of good laboratory practice that dates received and opened, and the initials of the analyst recording those dates, be marked on all pH buffers in use.

WV Response: *It is laboratory procedure to indicate the date received/opened on the buffers. The laboratory uses about a bottle every two weeks. The unmarked bottle during the on-site was a rare oversight of the analyst. We are going to start the practice of recording the analysts initials along with the dates.*

EPA Comment: Acceptable

B. According to paragraphs 3.3.2, calibrations of glass and electronic thermometers should be checked annually against an NIST reference thermometer and the results recorded in a log book. Although considerable records of thermometer calibrations were available, they were not organized in such a way as to easily determine the history of calibration of individual thermometers. This problem had been already identified by the Laboratory and a new form or log sheet had been create, but was not yet in use at the time of the on-site visit. One of the new forms will be used for each thermometer; therefore, the record of calibrations for any one thermometer will be readily available. The Laboratory should be commended for this improvement in record keeping.

WV Response: *New forms are now in use.*

EPA Comment: Acceptable

C. A further improvement in temperature record keeping would be to re-design the temperature recording tables to include the thermometer reading and the corrected temperature for each time the thermometer is read. When only the corrected temperature is recorded, there is no documentation that the analyst actually corrected the thermometer reading with the appropriate correction factor.

WV Response: *Currently, there is not enough room on the form to record the math as the main incubator contains 5 thermometers. All analysts are trained to record the corrected temperature.*

EPA Comment: Acceptable

D. Regarding records kept for each autoclave, it is recommended that the autoclave for which the records are being kept be clearly indicated on the record form. Although the clip board with the autoclave records hangs next to the relevant autoclave, there is no association recorded on paper between the records and the autoclave.

WV Response: *Forms now indicate to which autoclave they belong.*

EPA Comment: Acceptable

E. According to paragraph 3.11.5, the "lot number for membrane filters and date received should be recorded." The Laboratory has records of this QC practice up to 1997, but not beyond. The practice should be re-established.

WV Response: *We have not begun using membrane filter procedure for any samples. However, since we do certify other laboratories for the procedure we are going to maintain certification for it by annually analyzing PE samples and quarterly running a few samples and performing duplicate counts so that everyone can keep in practice with it. All appropriate QC forms that accompany the MF procedure will be in order. For the filters, the lot number, date received and date put into service will be recorded on a QC form.*

EPA Comment: Acceptable

F. Although the Laboratory, pursuant to paragraph 3.14.2, is checking the calibration of each new lot of pre-calibrated test vessels (for Colilert test) and has produced a commendable record documenting this QC practice, it is recommended that the actual volume obtained be recorded instead of only a check mark. A record of actual volumes would provide raw data that could be assessed independently by other analysts, the microbiology supervisor, or the Laboratory QA officer, and therefore would represent better documentation. Long term trends in test vessel calibration could also be identified.

Response: *Actual volumes are now being recorded.*

EPA Comment: Acceptable

G. According to paragraph 4.4.3, "each batch of dilution/rinse water should be checked for sterility by adding 50 mL of water to 50 mL of a double strength non-selective broth (e.g., tryptic soy, trypticase soy, or tryptose broth)" and incubated at 35±0.5 °C for 24 hours. If growth occurs entire batch of dilution water should be discarded. At the time of the on-site visit, the Laboratory was not performing this QC sterility check. It is

strongly recommended that this QC procedure be performed on all batches of dilution or rinse water, and the results recorded with the other media and dilution water preparation records. Note that if the 50 mL of non-selective broth is sterilized in a typical dilution bottle, the sterility check of the dilution or rinse water can be performed by pouring (with sterile technique) 50 mL of the water into the bottle containing the broth and incubating.

WV Response: *This procedure use to be in place but for some reason, possibly the turn-over in personnel, was forgotten. This procedure is now being put back into place.*

EPA Comment: Acceptable

H. It is further recommended that, as matter of good laboratory practice, whenever the pH of a batch of media falls outside the acceptable range, the action taken (e.g., "batch discarded") and analyst's initials be recorded in the media prep log book.

WV Response: *The laboratory has in the past used "REJECTED" stickers when this happens. However, an example of this could not be found during the on-site, nor could the "REJECTED" stickers be found. I will be making new rejected stickers for this purpose and have the analysts initial and record the action taken.*

EPA Comment: Acceptable

I. Currently when performing the Colilert analysis, the 100 mL±2.5 mL sample test volume is obtained by carefully decanting 100 mL of the sample directly into the sterile IDEXX test vessel and subsequently comparing the volume in the test vessel against a second vessel clearly marked with the acceptable volume range (97.5-102.5 mL). It is recommended that this procedure be improved by doing the comparison at eye-level to make the best evaluation possible. Both bottles should be placed side by side on a platform fixed at eye-level. This recommendation follows what is generally accepted as good laboratory practice when reading any graduated measuring device, such as graduated cylinders or pipettes, i.e., they should always be read at eye-level.

WV Response: *We are going to contact the maintenance department and see if a shelf can be built over the middle of the table.*

EPA Comment: Acceptable

J. Although the laboratory keeps detailed records of all analytical work, including the time an analysis begins, the time any subsequent analyses begins is not recorded. Paragraph 8.4.2 is understood to apply to any subsequent or additional analysis begun after the initial analysis. For example, if a positive MTF test is transferred to BGBB for confirmation, the time of the transfer should be recorded because the BGBB

confirmatory test is a new analysis. Likewise if a positive MTF test is also transferred to EC medium for fecal coliforms, the time of transfer should be recorded because it marks the beginning of a new analysis. In other words, it is recommended that for the purpose of quality control, there should be documen-tation that all tests--presumptive, confirmatory, initial, subsequent, or otherwise--were incubated for the appropriate periods. Documentation on a batch by batch basis would be sufficient.

WV Response: *We are now making notes on the bench sheets with the start times of all analysis and when samples are read out.*

EPA Comment: Acceptable

K. Similarly, it is recommended that for the Colilert analysis the time when the Colilert tests are read be recorded. This practice would be most important in those cases where a test, following the normal 24 hour incubation, is incubated for an additional 4 hours. The manufacturer cautions that a positive result (yellow color) after incubation for more than 28 hours is not a valid positive. Care should be taken not to incubate samples in excess of 28 hours. (See paragraph 5.6.5.)

WV Response: *See response to Item "J".*

EPA Comment: Acceptable

L. At the present time, in order to neutralize residual chlorine in a sample, sample bottles are loaded with the appropriate amount of sodium thiosulfate prior to sterilization of the bottle. In addition, when performing the Colilert test, sample is poured into a sterile test vessel that also contains sodium thiosulfate in powdered form. Consequently, residual chlorine is probably being effectively neutralized in all samples analyzed with Colilert. However, with regard to the MTF method, it is possible that in some cases, excessive chlorination is not completely neutralized by the sodium thiosulfate in the sample bottle. It is recommended that a portion of these samples each month (e.g., 10%) be tested with a drop of iodine solution for excess sodium thiosulfate which will be present if all residual chlorine was neutralized. The iodine drop test could be easily performed (by a second analyst) on the sample water remaining in the collection bottle once the 100 mL test volume was removed. The sodium thiosulfate reacts with the iodine to produce sodium tetrathionate and sodium iodide both of which are colorless; consequently the amber color produce by the drop of iodine quickly disappears. If sodium thiosulfate is not present the amber color remains. A similar recommendation was made in 1996.

WV Response: *We have not yet started this procedure. Is there a written procedure that could be forwarded? And could you provide information as to were to obtain the "Iodine Solution"?*

EPA Comment: Acceptable

M. Currently water samples are collected in unmarked bottles and sent to the laboratory with the collection form wrapped around the bottle. Once the unmarked bottle containing the sample arrives in the laboratory, the identity of the bottle and sample depends entirely on the collection form staying with the sample. Because there is no unique identifier (such as a number) on the bottle, there is always the risk of losing the identity of the sample should the collection form and sample become separated. It is recommended that each sample bottle be marked (using an indelible ink marker) with a unique number that is recorded on the sample collection form by the collector. This procedure would insure that all collection information is clearly associated with a sample whether the collection form is kept with the sample or not.

WV Response: *We are in the process of ordering new Water Bacteriological Report Forms. The new forms will have a place to record the sample container number. We will be beginning the process of numbering all of our sample containers.*

EPA Comment: Acceptable

V. Conclusions

A QAP/SOP and successful analysis of PE samples annually are essential requirements for maintaining full SDWA certification. **If EPA receives confirmation that PE samples have been successfully analyzed for total coliform and fecal coliform (or E. coli) bacteria, and a QAP/SOP is completed, the Laboratory will be recommended for full certification under the Safe Drinking Water Act.**

David E. Russell — 4/14/00
Microbiological Evaluator — Date

CORRECTIVE ACTION PLAN

IN

RESPONSE

TO

SDWA LAB CERTIFICATION PROGRAM

ON-SITE REVIEW

December 1-2, 1999

BY

Office of Analytical Services and Quality Assurance

FROM

WEST VIRGINIA DEPARTMENT OF HEALTH AND HUMAN RESOURCES

OFFICE OF LABORATORY SERVICES

ENVIRONMENTAL CHEMISTRY LABORATORY

CHARLESTON, WEST VIRGINIA

Comments from EPA Assessor
Joseph Slayton
April 14, 2000

It is readily apparent from an examination of the West Virginia Laboratory Certification Program for Chemistry that it suffers from a lack of defining procedures SOPs and documentation. In the next year to eighteen months a considerable amount time and effort will be expended in order to remedy most, if not all, of these inadequacies.

Obervations & Suggestions:

1. **Proficiency Testing (PT) Samples:** The WV Laboratory Certification Program (WVLCP) has not decided on the details of operating the new PT program (the EPA no longer provides PE/PT samples). The WVCLP should establish a schedule for laboratories to participate in Water Supply studies.

   WV Response: During the on-site evaluation of our WVLCP for Chemistry I expressed our desire to set up a defining schedule in which the primary annual WS PT sample for those analytes a laboratory was seeking certification would be obtained/analyzed and the analytical results forwarded to our office for review no later than the end of the first quarter (March 31st) of each year. The make- up WS PT (for those analytes missed on the primary WS PT sample) sample would then need to be analyzed and reported to our office no later than the end of the third quarter (September 30th) of each year.
   Since then I have decided that it would be better for our program if the make up PT termination date were to be set at the end of August each year rather than the end of September. This would allow more time for the recording of all PT results data (presently a time-consuming process) on each certified laboratory s index card and for an in-depth analysis of their certification status. This would materially simplify the process of sending out renewal notices/invoices by our usual target date of mid-October each year.
   Such a schedule for our PT program will be documented in a written SOP covering the topics detailed in your* Observations & Suggestions. *A letter detailing the substance of this SOP will be drafted and forwarded (by registered or certifed mail) to all certified labs.

   EPA Comment: Response clear and acceptable.

2. On-Site Laboratory Inspections:

The WVCLP should maintain a record which lists the dates of inspections, analytes/analyte groups reviewed, certification status and the target/projected/estimated date (at least quarter) for the next on-site.

WV Response: Implementation of this recommended procedure will begin with this year's on-site examinations.

We now have ten in-state laboratories to audit. The initiation of a program that will more evenly spread out these on-sites for each year (over a three year period) will also be put

in place this year, 2000 (instead of inspecting all ten this year). In order to do this it is anticipated that there will be four on-sites in 2000, four in 2001 and three in 2002 (one and possibly two of our certified labs will be audited every other year for a presently indefinite period of time). Records of these scheduled on-sites will be recorded as detailed in your discussion of this section.

EPA Comment: Response clear and acceptable. **If not already included in the 2000 SDWA questionnaire please forward schedule to assessor.**

4. Documentation:

The documentation for the Microbiology Certification Program was complete and well organized. The Chemistry Certification Program lacked written procedures for Lab Certification (as detailed above for Microbiology). It is suggested that an SOP/QA Manual for the drinking water laboratory certification chemistry program be prepared.

WV Response: Although it is probably not as extensive or complete as that for the Microbiology Certification Program the Chemistry Certification Program does have an SOP/QA manual for drinking water laboratory certification. This manual is titled Laboratory Cerjtification Standard Operating Procedure for West Virginia Bureau of Public Health, Office of Laboratory Service, SDWA Lab Certification Program. A copy of the Title page and the Table of Contents has been included for your examination. This manual is badly in need of being up-dated. We have some standard letters and methods check-lists in place that really should be included in this manual.

EPA Comment: Response clear and acceptable. **Please forward a copy of the entire document.**

5. Personnel:

Given that Dr. Morganroth alone can certify laboratories to perform organic analyses in West Virginia, it is critically important to the WV Laboratory Certification Program to assure that Mr. Larry Duffield and Mr. Greg Young are approved as Certification Officers for organic chemistry, as well as inorganic chemistry as soon as possible.

WV Response: Mr. Larry Duffield's name (and additional, requested information) has been sent to Charles Jones (Region III, Philadelphia, PA) as an applicant for the Certification Officer training to be given in Cincinnati in September, 2000. This year he will be seeking certification only in the area of inorganic chemistry, however, he has verbally informed me that he would attend in 2001 for certification in the area of organic chemistry. In addition Mr. Greg Young has informed me that he would also attend a certification officers training course (for certification in the area of inorganic chemistry). This will be implemented as soon as it is practicable.

EPA Comment: Response clear and acceptable.

6. **NELAC:**

As described previously, the WV's Laboratory Certification Program for Chemistry should be reflected in a detailed QA Manual as currently available for the Microbiology Certification Program. Also, for this update it is recommended that the laboratory consider the sections required by the National Environmental Laboratory Accreditation Conference/Program (NELAC) for a Quality Manual.

WV Response: Once the NELAC document referred to is secured work will begin on the development of a detailed and more satisfactory Quality Manual.

EPA Comment: Response clear and acceptable. **A hardcopy of the standard will be FedXed 4/16/00.**

Sincerely,

Joseph Slayton

Associated Director of Science

June 8, 2000

Andrea M. Labik, Sc. D.
Director
West Virginia Department of Health & Human Resources
Office of Laboratory Services
Environmental Chemistry Laboratory
Charleston, West Virginia

Re: Follow-up to the May 14, 2000 report entitled "Response to EPA's Comments on West Virginia's Corrective Action Plan Relative to the Laboratory Evaluation Report (SDWA) Resulting from the On-Site Evaluation By EPA Region III Evaluators" (Inorganic Chemistry) and Follow-up to the May 14, 2000 report entitled , "Response to EPA's Comments on West Virginia's Corrective Action Plan, Relative to the SDWA Lab Certification Program Resulting from the On-Site Evaluation by EPA Region III Evaluators".

Dear Dr. Labik:

Thank you for the follow-up response to items not fully addressed by the correction actions planned relative to the on-site SDWA assessment. We hope that you will continue to pursue your plans and efforts to bring your laboratory facilities Internet access. The continued lack of E-Mail at "Big Chimney" continues to slow communications concerning inorganic chemical analyses and SDWA certification program (chemistry).

Dr. David Russell is working with Tom Ong to close out the remaining microbiology issues and will be providing a close out letter in the near future.

We understand that Charlotte Billingsley is back working part time. Great News! Please convey are well wishes.

Inorganic Chemistry:

All of the inspection findings have been addressed and the assessors agree with the corrective actions. However, relative to the purchase of PT samples for fluoride and other anions (planned for May 15th) , the assessors request that you provide a projected date when the PT study results would be forwarded to EPA.

With regard to the issue of drinking water samples which are not properly preserved or which exceed the required holding time, further discussions with our Region 3, Water Protection Division Program Office (Office of Municipal Assistance) has provided the following resolution of this issue: The laboratory is to flag (label) the analytical results for drinking water samples which are not properly preserved or do not meet the technical holding times with "Not Valid for SDWA Compliance Reporting". Based upon this approach, we recommend that the certification status for Turbidity and Conductance be upgraded to "Fully Certified" and that sulfate and TDS be upgraded to fully "acceptable" (secondary analytes).

Certification Status: The assessors recommend the following SDWA certification status based upon the November 30, 1999 on-site laboratory inspection and the resulting corrective actions:

Certified:

Arsenic; Antimony; Barium; Beryllium; Cadmium; Chromium; Copper; Lead; Mercury; Selenium; Sodium; Thallium; Nitrite; Nitrate, Fluoride, Turbidity, Conductance.

Secondary Analytes:

Acceptable: Chloride, Sulfate and TDS.

SDWA Laboratory Certification Program: All of the suggestions to improve the program resulting from the December 1, 1999 review have been implemented. Please thank your Certification Officers for their efforts.

Inspectors:

6/8/00
Joseph Slayton Date

6/8/00
Robin Costas Date

Sincerely,

Joseph Slayton
Associated Director of Science

cc: Charles Jones, Jr. (3ES10)
Jason Gambatese (3WP22)
Richard Rogers (3WP22)

PEs/PTs

ENVIRONMENTAL RESOURCE ASSOCIATES®

WS-37 Data Reporting Cover Sheet (COPY)

30 Sep 1999

a) Enter your LABORATORY INFORMATION

CONTACT NAME:	Wayne Morganroth	USEPA LAB CODE:	WV00003
LAB NAME:	Off Lab Svcs, Environmental Chemistry Lab	STATE LAB CODE	00003 C
ADDRESS:	4710 Chimney Drive, Suite G	PHONE #	1 (304) 558-0197
	Charleston, WV 25302	FAX #	1 (304) 558-4143
CITY	Charleston, ST WV ZIP 25302	EMAIL	None

b) Enter your REGULATORY AGENCY INFORMATION

The price for your InterLaB™ study includes a report being sent to you and to your primary accrediting agency. Additional reports can be sent to other accrediting authorities at a cost of $10.00 per report. Please circle all accrediting agency(ies) that you are authorizing ERA to send copies of your InterLaB WatR™ Pollution, WS-37 study final report.

Alabama	Georgia	Louisiana	Nebraska	Oregon	Vermont
Alaska	Guam	Maine	Nevada	Pennsylvania	Virginia
Arkansas	Hawaii	Maryland	New Hampshire	Puerto Rico	Virgin Islands
Arizona	Idaho	Massachusetts	New Jersey	Rhode Island	Washington
California	Illinois	Michigan	New York	South Carolina	(West Virginia)
Colorado	Indiana	Minnesota	North Carolina	South Dakota	Wisconsin
Connecticut	Iowa	Mississippi	North Dakota	Tennessee	Wyoming
Delaware	Kansas	Missouri	Ohio	Texas	A2LA
Florida	Kentucky	Montana	Oklahoma	Utah	

c) Sign the ATTESTATION STATEMENT

Per the requirements of the USEPA's National Standards for Water Proficiency Testing Studies, please read this attestation statement. By affixing your signature below, you attest that your InterLaB™ WS-37 study results have met the following criteria. 1) The InterLaB™ WS-37 study standards for which you are submitting results were not analyzed by any other laboratory. 2) Your laboratory has not knowingly received InterLaB™ WS-37 study standards for analysis from any other laboratory. 3) No information was solicited from ERA or any other laboratories concerning the assigned values or acceptance ranges for InterLaB™ WS-37 study standards.

Official Laboratory Contact (signature) Wayne Morganroth

Official Laboratory Contact (please print) Wayne Morganroth Date: September 24, 1999

Return this sheet plus all "*WS-37 DATA REPORTING SHEET(S)*" to ERA by FAX or Mail.
Deadline for receipt of data is September 28, 1999.

Total Pages:_____ ERA will verify that all faxes are legible and complete. If there are any problems with your fax transmission, ERA will contact you immediately with any questions.

Questions? See the *WP DATA REPORTING INSTRUCTIONS* or call ERA at 1-800-372-0122

ENVIRONMENTAL RESOURCE ASSOCIATES®

WS-37 Metals Data Reporting Form

INSTRUCTIONS: Please fill in the results, method references, and analysis dates for the analyte(s) you wish to report for ERA's WS-37 PT Study and return to ERA as described in the WS-37 Data Reporting Instructions. Questions? Call ERA at 1-800-372-0122.

Customer: BUREAU OF PUBLIC HEALTH **Customer Code: W2134-01**

ERA Standard	Analyte	Result	Units	Method	Analysis Date
Metals	Aluminum	85.6	µg/l	SM3113B	9/2/99
	Antimony	33.5	µg/l	SM3113B	9/13/99
	Arsenic	1.16	µg/l	SM3113B	9/9/99
	Barium	221.0	µg/l	EPA200.7	9/15/99
	Beryllium	5.60	µg/l	SM3113B	9/1/99
	Boron		µg/l		/ /
	Cadmium	26.1	µg/l	SM3113B	9/1/99
	Calcium		mg/l		/ /
	Chromium	95.4	µg/l	SM3113B	9/2/99
	Copper	77.8	µg/l	SM3113B	8/31/99
	Iron	1.17	µg/l	SM3111B	9/8/99
	Lead	60.2	µg/l	SM3113B	8/31/99
	Manganese	3.12	µg/l	SM3111B	8/30/99
	Molybdenum		µg/l		/ /
	Nickel	1.76	µg/l	SM3113B	9/2/99
	Selenium	42.6	µg/l	SM3113B	9/10/99
	Silver		µg/l		/ /
	Thallium	4.99	µg/l	EPA200.9	9/14/99
	Zinc	5.68	µg/l	SM3111B	8/30/99
	*Hardness as $CaCO_3$		mg/l		/ /
Mercury	Mercury	2.00	µg/l	EPA245.1	9/21/99
Titration Hardness	Hardness as $CaCO_3$	146	mg/l	SM3500D	9/15/99

*The Hardness as $CaCO_3$ in the metals sample is amenable to analysis by ICP or Flame AA methodologies only. If you are using a titration method, please call ERA for a replacement standard for Titration Hardness as $CaCO_3$.

ENVIRONMENTAL RESOURCE ASSOCIATES® WS-37 Inorganic Data Reporting Form

INSTRUCTIONS: Please fill in the results, method references, and analysis dates for the analyte(s) you wish to report for ERA's WS-37 PT Study and return to ERA as described in the WS-37 Data Reporting Instructions. Questions? Call ERA at 1-800-372-0122.

Customer: BUREAU OF PUBLIC HEALTH **Customer Code: W2134-01**

ERA Standard	Analyte	Result	Units	Method	Analysis Date
pH	pH		S.U.		/ /
Inorganics	Bromide		mg/l		/ /
	Chloride	8.12	mg/l	EPA300.0	9/23/99
	Conductivity	365	µmhos	SM2510B	9/22/99
	Fluoride	4.54	mg/l	EPA300.0	9/23/99
	Nitrate as N	6.30	mg/l	EPA353.2	9/22/99
	Potassium		mg/l		/ /
	Sulfate	45.8	mg/l	EPA300.0	9/23/99
	Total Dissolved Solids	330	mg/l	EPA160.1	9/24/99
Alkalinity & Sodium	Alkalinity as $CaCO_3$		mg/l		/ /
	Sodium		mg/l		/ /
Turbidity	Turbidity	3.96	NTU	EPA180.1	9/16/99
Residual Chlorine	Free Residual Chlorine		mg/l		/ /
	Total Residual Chlorine		mg/l		/ /
Nitrite	Nitrite as N	1.69	mg/l	EPA353.2	9/22/99
Nutrients	ortho-Phosphate as P		mg/l		/ /
Cyanide	Cyanide		mg/l		/ /
TOC	TOC		mg/l		/ /
Chlorite	Chlorite		µg/l		/ /
Bromate & Chlorate	Bromate		µg/l		/ /
	Chlorate		µg/l		/ /

ENVIRONMENTAL
RESOURCE ASSOCIATES

QuiK™ Response PE Standard Data Reporting Sheet

Corrosivity

Customer: Bureau of Public Health
Lot Number: 08059907

Standard Preparation Instructions: None required; the standard is ready for analysis as received. The standard was manufactured and calculated as per Standard Methods 17th Edition 1985; Method #2330 "Calcium Carbonate Saturation". Saturation Index = pH - pH_s.

Parameter	Result	Units	Method	Analysis Date
PH	9.06	S.U.	EPA150.1	9/ 9/99
Alkaliniaty	343	mg/L	SM2320B	9/ 8/99
TDS	1001	mg/L	EPA160.1	9/24/99
Calcium	134	mg/L	SM3500D	9/ 8/99
Sodium	159	mg/L	SM3111B	9/ 9/99

Results reported by: Wayne Morganroth

EPA/State Lab ID#: WV00003

FAX number: 1 (304) 558-4143

Mail results to:
QuiK™ Response Data Reporting Group
Environmental Resource Associates
5540 Mashall Street
Arvada, CO 80002

FAX: **303-421-0159**

Single blind PE sample required for:

___Corrective Action for EPA WP
_X_Corrective Action EPA WS
___Corrective Action EPA DMRQA
___State Certification (Initial or Renewal)

Performance Evaluation Report
USEPA Water Supply Study WS039

Participant ID: WV00003 Type: STATE Requesting Office: R03

Sample Number	Reported Value	True Value*	Acceptance Limits	Performance Evaluation
TRACE METALS IN MICROGRAMS PER LITER:				
002-BARIUM				
001	1110	1100	935- 1270	Accept.
226-BORON				
002	643	599	573- 670	Accept.
NITRATE/NITRITE/FLUORIDE IN MILLIGRAMS PER LITER:				
010-FLUORIDE				
001	2.84	2.90	2.61- 3.19	Accept.
MISCELLANEOUS ANALYTES:				
145-SULFATE(MILLIGRAMS PER LITER)				
001	434.0	490	440- 538	Not Accept.

********** END OF DATA FOR WV00003 **********
NOTE: FOR LIMITS AND TRUE VALUES, ASSUME THREE SIGNIFICANT DIGITS.
********** END OF REPORT FOR WV00003 **********

* Based on gravimetric calculations, or a reference value when necessary.

Report: PE005
Page: 1
Date: 18MAR98

Performance Evaluation Report
USEPA Water Supply Study WS040

Participant ID: WV00003 Type: STATE Requesting Office: RC3

Sample Number	Reported Value	True Value*	Acceptance Limits	Performance Evaluation
TRACE METALS IN MICROGRAMS PER LITER:				
001-ARSENIC				
001	112	102	89.3- 113	Accept.
002-BARIUM				
001	3020	2700	2300- 3110	Accept.
003-CADMIUM				
001	5.99	6.31	5.05- 7.57	Accept.
004-CHROMIUM				
001	95.7	90.9	77.3- 105	Accept.
005-LEAD				
001	68.6	71.0	49.7- 92.3	Accept.
006-MERCURY				
001	1.40	1.50	1.05- 1.95	Accept.
007-SELENIUM				
001	79.5	74.0	59.2- 88.8	Accept.
091-COPPER				
001	1680	1700	1530- 1870	Accept.
140-ANTIMONY				
001	14.0	13.0	9.1- 16.9	Accept.
141-BERYLLIUM				
001	6.58	6.60	5.61- 7.59	Accept.
142-NICKEL				
001	25.9	25.0	21.3- 28.8	Accept.
226-BORON				
002	1230	1150	1050- 1290	Accept.
236-MANGANESE				
002	30.0	32.0	27.7- 35.2	Accept.
237-MOLYBDENUM				
002	38.2	35.0	29.6- 40.1	Accept.
239-ZINC				
002	1750	1700	1620- 1850	Accept.
NITRATE/NITRITE/FLUORIDE IN MILLIGRAMS PER LITER:				
009-NITRATE AS N				
001	7.19	7.10	6.39- 7.81	Accept.
010-FLUORIDE				
001	1.31	1.29	1.16- 1.42	Accept.
092-NITRITE AS N				
001	1.7	1.30	1.11- 1.5	Not Accept.
261-ORTHOPHOSPHATE AS P				
001	2.65	0.820	0.745-0.882	Not Accept.
MISCELLANEOUS ANALYTES:				
022-RESIDUAL FREE CHLORINE(MILLIGRAMS PER LITER)				
001	0.35	0.240	0.0199-0.364	Accept.
023-TURBIDITY(NTU'S)				
001	7.81	7.80	7- 9.67	Accept.

Performance Evaluation Report
OSEPA Water Supply Study WS040

Participant ID: WVCCOC3 Type: STATE Requesting Office: F03

Sample Number	Reported Value	True Value*	Acceptance Limits	Performance Evaluation
024-TOTAL FILTERABLE RESIDUE(MILLIGRAMS PER LITER)				
001	204	232	147- 380	Accept.
025-CALCIUM HARDNESS(MG. CACO3/L)				
001	92.C	95.C	88- 104	Accept.
026-PH-UNITS				
CC1	9.17	9.13	8.93- 9.33	Accept.
027-ALKALINITY(MG. CACO3/L)				
001	36.C	34.4	32.8- 39.6	Accept.
029-SODIUM(MILLIGRAMS PER LITER)				
C01	15.9	15.8	14.4- 17.8	Accept.
145-SULFATE(MILLIGRAMS PER LITER)				
001	198.9	225	202- 247	Not Accept.

********** END OF DATA FOR WVCCCO3 **********
NOTE: FOR LIMITS AND TRUE VALUES, ASSUME THREE SIGNIFICANT DIGITS.
********** END OF REPORT FOR WV00003 **********

* Based on gravimetric calculations, or a reference value when necessary.

Performance Evaluation Report
USEPA Water Supply Study WS041

Participant ID: WV00003 Type: STATE Requesting Office: R03

Sample Number	Reported Value	True Value*	Acceptance Limits	Performance Evaluation
TRACE METALS IN MICROGRAMS PER LITER:				
143-THALLIUM				
001	3.34	3.50	2.45- 4.55	Accept.
NITRATE/NITRITE/FLUORIDE IN MILLIGRAMS PER LITER:				
092-NITRITE AS N				
001	1.66	1.70	1.45- 1.96	Accept.
261-ORTHOPHOSPHATE AS P				
001	1.98	1.30	1.19- 1.39	Not Accept.
MISCELLANEOUS ANALYTES:				
145-SULFATE(MILLIGRAMS PER LITER)				
001	46.84	49.0	44.1- 54.2	Accept.

********** END OF DATA FOR WV00003 **********
NOTE: FOR LIMITS AND TRUE VALUES, ASSUME THREE SIGNIFICANT DIGITS.
********** END OF REPORT FOR WV00003 **********

* Based on gravimetric calculations, or a reference value when necessary.

ENVIRONMENTAL RESOURCE ASSOCIATES®
The Industry Standard™

QuiK™ Response PE Standards

Final Report

PotableWatR™ Metals

Customer: Bureau of Public Health
Lot Number: 11290101
State ID Number: WV00003
Method: SM3113B

Parameter	Units	Reported Value	Certified Value	QuiK™ Response Limits	Comment
arsenic	µg/l	118.0	105	91.9 - 117	Not Acceptable

Results reported by: Wayne Morganroth - Bureau of Public Health

Date of Report: 12/14/01

OPTIONAL FORM 99 (7-90)
FAX TRANSMITTAL # of pages ▶ 2

To Robert LANGE	From Joe Slayton
Dept./Agency	Phone # 410 305 2653
Fax # 215 814 2302	Fax #

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

ENVIRONMENTAL
RESOURCE ASSOCIATES®
The Industry Standard™

December 14, 2001

Joseph Slayton
OASQA, ESC
701 Mapes Road
Ft. Mead, MD 20755-5350

FAX 410-305-3095

Dear Joseph:

On November 29, 2001, Bureau of Public Health located in Charleston, West Virgina, participated in ERA's QuiK™ Response Performance Evaluation Program. The following result was reported to ERA by Bureau of Public Health for the PE standard, lot 11290101. The Certified Value and the QuiK™ Response Acceptance Limits were not available to Bureau of Public Health.

If you have any questions, please contact either myself, or Shawn Kassner, Proficiency Testing Program Manager, at 1-800-372-0122.

Sincerely,

Anne E. Rager
QuiK™Response Coordinator

Cc: Project File Number 11290101

ACTIVITY MANAGEMENT REPORT TX

ACTY#	MODE	CONNECTION TEL	CONNECTION ID	START TIME	USAGE T.	PAGES	RESULT
*1416	TX ECM	914106764004		12/13 15:55	03'46	6	OK
*1418	TX ECM	912156710273		12/13 16:10	00'53	2	OK
1419	TX ECM	912025652558		12/13 16:25	01'01	2	OK
1430	TX ECM	912158143001		12/14 12:17	00'46	2	OK
1431	TX ECM	917815443086		12/14 15:36	01'22	2	OK
1432	TX ECM	912158145211		12/14 15:46	02'19	6	OK
1435	TX ECM	916104919645		12/14 16:15	00'39	2	OK
1436	TX ECM	913042310920		12/14 16:17	00'40	2	OK
1437	TX ECM	913047551880		12/14 16:18	00'38	2	OK
1438	TX ECM	916102931920		12/14 16:20	00'38	2	OK
1439	TX ECM	914109624972		12/14 16:22	00'46	2	OK
1440	TX ECM	913013453716		12/14 17:50	02'12	6	OK
1443	TX ECM	913013453716		12/17 10:00	00'51	2	OK
1444	TX ECM	916102931920		12/17 10:39	00'38	2	OK
1453	TX ECM	912158142783		12/19 09:55	00'49	2	OK
1454	TX	914103052653		12/19 10:14	00'00	0	NG 0 STOP
1455	TX ECM	912158142302		12/19 10:15	00'43	2	OK

ACTIVITY MANAGEMENT REPORT RX

ACTY#	MODE	CONNECTION TEL	CONNECTION ID	START TIME	USAGE T.	PAGES	RESULT
*1415	AUTO RX ECM	215 814 3015		12/13 15:41	01'20	3	OK
*1417	AUTO RX ECM	2158142301		12/13 16:01	00'48	2	OK
1420	AUTO RX ECM	781 544 3086		12/13 17:02	01'22	2	OK
1421	AUTO RX ECM			12/13 18:39	00'53	1	OK
1422	AUTO RX ECM	916 985 1020		12/13 20:11	02'54	6	OK
1423	AUTO RX ECM			12/14 04:39	05'21	4	OK
1424	AUTO RX ECM	6104919645		12/14 08:45	01'42	4	OK
1425	AUTO RX ECM	7037343321		12/14 09:08	00'33	1	OK
1426	MEMORY RX ECM	6102931920		12/14 10:29	07'53	12	OK
1427	AUTO RX ECM		TSP SERVICE OFFI	12/14 10:38	00'45	2	NG 2 #037
1428	AUTO RX ECM		TSP SERVICE OFFI	12/14 10:42	00'47	2	OK
1433	AUTO RX ECM			12/14 16:07	02'45	8	OK
1434	AUTO RX ECM	6102931920		12/14 16:10	01'46	4	OK
1441	AUTO RX ECM	0348695918000		12/14 20:22	02'02	2	OK
1442	AUTO RX ECM	6104919645		12/17 07:29	07'19	13	OK
1445	AUTO RX ECM			12/17 13:08	00'41	2	OK
1446	AUTO RX ECM	202 565 2558		12/18 09:51	01'57	5	OK
1447	AUTO RX ECM	4017823004		12/18 10:28	00'57	2	OK
1448	AUTO RX ECM	1 303 4210159		12/18 11:09	01'13	3	OK
1449	AUTO RX ECM	4017823004		12/18 11:58	00'56	2	OK
1450	AUTO RX ECM	916 985 1020		12/18 15:04	02'54	4	OK
1451	AUTO RX ECM	703 264 9360		12/18 15:10	02'08	4	OK
1452	AUTO RX ECM	215 8142783		12/19 08:19	04'20	12	OK

WATER:

JASon GAmbetese

215-814-5759

FAX 231B

DIRECTIONS: ↓

Take I64 West
take Montrose Exit
take left onto McCorkle
past Indian Grave yd.

2nd Stoplight take Right
onto E Street
turns into 11th Street

one story Brick Bld.
near river

Directions to Big Chimney

"E" Street → left on MacCorkle
Right onto Montrose
64 EAST
77/79 NORTH to Parkersburg/Clarksburg
79 NORTH to Clarksburg
119(N) MIN-K Shoals
^Right
Right at Lab at Elks bldg

S. Charleston WV

Human Resources
Bureau of Public Health
Nov , 1999

WV Bureau for Public Health,
Office of Lab Services
Envir Chemistry Lab Section

Office of Lab Services

4710 Chimney Drive, Suite G
Charleston, WV 25302

Wayne Morgenroth	Lab Supervisor
304-558-0197	Chemist
FAX 4143	
Larry A. Duffield	metals
Greg W. Young	NO_2, NO_3
	pH Cl^-
	F^- Cond.
	Hardness

Director?
"Laybik"
~~Dr~~ Andrea LABIK, PHD.
S.C.D.
304-558-3530

org chart ↓

Oct 20th
Clinical experience

Freedom_0005800_0110

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

V A. Preservation and Holding Times for Regulated Parameters

Parameter/ Method	Preservative	Sample Holding Time	Extract Holding Time	Suggested Sample Size	Type of Container
Metals (except Hg)	HNO_3, pH<2	6 months		1 L	Plastic or Glass
Mercury	HNO_3, pH<2	28 days		~~100 mL~~ 1 L	Plastic or Glass
Alkalinity	Cool, 4C (*)	14 days		~~100 mL~~ 1 L	Plastic or Glass
Asbestos	Cool, 4C	48 hours			Plastic or Glass
Chloride	none	28 days		~~50 mL~~ 1 L	Plastic or Glass
Residual Disinfectant	none Cl_2 ?	immediately ?		200 mL	Plastic or Glass
Color	Cool, 4C	48 hours		50 mL	Plastic or Glass
Conductivity	Cool, 4C (*)	28 days		~~100 mL~~ 1 L	Plastic or Glass
Cyanide	Cool, 4C, Ascorbic acid (if chlorinated), NaOH pH>12	14 days		1 L	Plastic or Glass
Fluoride	none	28 days		~~300 mL~~ 500 mL	Plastic or Glass
Foaming Agents	Cool, 4C	48 hours			
Nitrate (chlorinated)	Cool, 4C	28 days		100 mL	Plastic or Glass
Nitrate (non chlorinated)	Cool, 4C, H_2SO_4, pH<2	14 days		100 mL	Plastic or Glass
Nitrite	Cool, 4C	48 hours		~~50 mL~~ 100 mL	Plastic or Glass
Odor	Cool, 4C	24 hours		200 mL	Glass
pH	none	immediately (+)		~~25 mL~~ 1 L	Plastic or Glass
o-Phosphate	Filter immediately, Cool, 4C	48 hours		50 mL	Plastic or Glass
Silica	Cool, 4C	28 days		100 mL	Plastic
Solids (TDS)	Cool, 4C (*)	7 days @		~~100 mL~~ 1 L	Plastic or Glass
Sulfate	Cool, 4C (*)	28 days		~~50 mL~~ 1 L	Plastic or Glass

Req [illegible handwriting]

Parameter/ Method	Preservative	Sample Holding Time	Extract Holding Time	Suggested Sample Size	Type of Container
Temperature	none	immediately		1 L	Plastic or Glass
Turbidity	Cool, 4C (*)	48 hours (**)		~~100 mL~~ 1 L	Plastic or Glass
502.2	Sodium Thiosulfate or Ascorbic Acid, 4C, HCl pH<2	14 days		40-120 mL	Glass with Teflon Lined Septum
504.1	Sodium Thiosulfate Cool, 4C,	14 days	4C, 24 hours	40 mL	Glass with Teflon Lined Septum
505	Sodium Thiosulfate Cool, 4C	14 days (7 days for Heptachlor)	4C, 24 hours	40 mL	Glass with Teflon Lined Septum
506	Sodium Thiosulfate Cool, 4C, Dark	14 days	4C, dark 14 days	1 L	Amber Glass with Teflon lined Cap
507	Sodium Thiosulfate Cool, 4C, Dark	14 days (see method for exceptions)	4C, dark 14 days	1 L	Amber Glass with Teflon Lined Cap
508	Sodium Thiosulfate Cool, 4C, Dark	7 days (see method for exceptions)	4C, dark 14 days	1 L	Glass with Teflon Lined Cap
508A	Cool, 4C	14 days	30 days	1 L	Glass with Teflon Lined Cap
508.1	Sodium Sulfite HCl pH<2 Cool, 4C	14 days (see method for exceptions)	30 days	1 L	Glass with Teflon Lined Cap
515.1	Sodium Thiosulfate Cool, 4C, Dark	14 days	4C, dark 28 days	1 L	Amber Glass with Teflon Lined Cap
515.2	Sodium Thiosulfate HCl pH<2 Cool, 4C, Dark	14 days	≤4C, dark 14 days	1 L	Amber Glass with Teflon Lined Cap
524.2	Ascorbic Acid HCl pH<2, Cool 4C	14 days		40-120 mL	Glass with Teflon Lined Septum

* Samples are received (via mail, UPS, etc.) in the laboratory at ambient temperature - they are then placed in a refrigerator at 4 degrees C.

\+ Since sample receipt in the laboratory is usually at least one to several days after the time of sampling, "immediate analysis" is precluded.

@ Due to the post-sampling "age" of most samples (see +, above), analyzing samples strictly within the maximum holding time period for these parameters is difficult or impossible.

** Yes if the sample is not "too old" when received in the laboratory.

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative